Report to the Malpai Borderlands Group:

RMRS Vegetation Manipulation Experiments, 1996-2002

Pete Sundt
Rangeland Consultant
Pima, Arizona

November 24, 2002

Report to the Malpai Borderlands Group:

RMRS Vegetation Manipulation Experiments, 1996-2002

RMRS-98180-RJVA

Pete Sundt
Rangeland Consultant
Pima, Arizona

November 24, 2002

Report to the Malpai Borderlands Group:

RMRS Vegetation Manipulation Experiments, 1996-2002

Pete Sundt
Rangeland Consultant
Pima, Arizona

November 24, 2002

Introduction

In the fall of 1996 experimental treatment plots were established by the US Forest Service Rocky Mountain Experiment Station at 5 locations in the Malpai Borderlands region: the Ed Roos Ranch near Rodeo, New Mexico, the Glenn Ranch near Douglas, Arizona, the San Bernardino National Wildlife Refuge near Douglas, the McDonald Ranch along Cottonwood Creek in Arizona, and the George Wright pasture of the Gray Ranch, south of Animas, New Mexico. At each of these sites, with the exception of the McDonald Ranch, a rectangular grid of 12 large plots was marked, each plot being 500ft x 500ft. The entire grid was fenced to exclude cattle, and a weather station erected. The plots were sampled in 1996 before treatment to estimate canopy cover of all plant species and of bare ground and litter, and basal cover was estimated for perennial grasses. Details of the sampling methods were provided in my 1996 report to MBG. In the spring of 1999 the following treatments were applied to randomly-chosen subsets of the plots at each site (Table 1): 1) control (no treatment); 2) crushing of the vegetation with a large water-filled drum pulled behind a Cat; 3) crushing and seeding of several perennial grasses with a range drill towed behind the crusher. In 1999, 2000, 2001 and 2002 all of the plots were re-sampled, using the same methods as in 1996. The San Bernardino Refuge site was not subjected to any of the crushing or seeding treatments; however, a wildfire occurred there in 1997, and it was re-sampled in 1999, 2000 and 2001.

Table 1. Treatments by plot.

Plot number	George Wright site	Roos Ranch site	Glenn Ranch site
1	Crush + seed	Crush + seed	Control
2	Crush	Control	Crush
3	Crush	Crush + seed	Crush + seed
4	Control	Crush	Control
5	Crush + seed	Crush	Crush + seed
6	Control	Control	Control
7	Control	Crush	Crush + seed
8	Crush	Control	Crush
9	Control	Crush + seed	Crush + seed
10	Crush + seed	Crush + seed	Crush
11	Crush	Crush	Control
12	Crush + seed	Control	Crush

The McDonald Ranch site consisted of only 5 plots and was subjected to a different treatment than the other sites. In November, 1998 four of the 5 plots were fenced and hay

made from the native grass cane beardgrass (*Bothriochloa barbinodis*) was scattered on the ground. In 3 of the plots mesquites were lopped by hand and the brush scattered. Cattle were introduced for a couple of days to eat the hay, scatter the seeds and trample them into the soil. A very wet storm occurred during the treatment. The site was sampled in 1996, 1999, 2000, 2001 and 2002.

Rainfall

Data from the RMRS website was compiled into monthly rainfall summaries for the Glenn, Rodeo and George Wright weather stations (see graphs). The period of record varies, and some data is missing due to electrical malfunctions. The record for Rodeo is complete for the period June 1999 to October 2002. The summer rains in 1999 were good, about 10in in July-September. The winter of 1999-2000 was dry. The summer rains of 2000 started pretty well, with almost 2in in June, but July was dry. August of 2000 had about 4.5in, but September was extremely dry. A hurricane in October brought over 5in. Overall the summer of 2000 was not favorable for perennial grasses, although the October rains probably prevented a lot of drought mortality. The year 2001 at Rodeo started out well, with almost 2in of rain in January, but the rest of the winter and spring were not very wet. July 2001 rain was only 1.5in, but August was pretty good, almost 4in. The summer 2001 total was 7.65in. Winter moisture was poor in 2001-2002. Rainfall at Rodeo in the summer months May-October of 2002 was less than 7in. A torrential downpour (2-3in in a few hours) in November deepened the gully that runs through the center of the study site.

Winter/spring moisture of 2000 was very low at the Glenns, but the summer started well with 2.5in in June and over 8.5in by the end of August. As at Rodeo, September 2000 was extremely dry and the hurricane of October probably saved a lot of grasses. Another pretty dry winter/spring followed in 2000-2001. The summer rains of 2001 started with almost 3.5in in June and almost 4.5in in July, but the rains slumped in August. May through October 2001 summer rainfall measured about 11in. Winter moisture in 2001-2002 at the Glenns (3.44in) was about the same as the previous year. A very dry early summer (just traces of rain from March until July) was followed by about 8in of rain in July-October. The summer 2002 total was less than 8in.

Electrical problems caused the loss of several important periods of data at the George Wright station, including July 20-September 2, 1999, June 1-July 15, 2000, and June 4-August 5, 2001. From the records that remain it can be seen that rainfall at George Wright was consistent with the regional pattern of a dry winter/spring 1999-2000. As at the other stations September 2000 was extremely dry. The October 2000 hurricane brought considerably less rain to George Wright than elsewhere (less than 3in), followed by about 1.5in in November. A pretty wet January was followed by a generally dry winter/spring 2001. Much of the summer rain record was lost, but only 1in fell in August and September wasn't much better. Less than 3in was recorded during the winter of 2001-2002, and another dry summer followed. No rain fell between March and July. The summer 2002 total was a little over 6in.

Glenn Ranch (WG)

Control plots

In most of the control plots neither woody plant nor grass cover changed significantly, but 2 plots showed anomalous patterns. Control plot WG-4 had a substantial increase in woody plant cover, mostly due to mesquite, over the time period 1996-2001, from 33% to 45%. It dropped to 39% in 2002. In WG-11 grass canopy cover decreased from 23% in 1996 to 10% in 2002, due mostly to a loss of bush muhly. Annuals spiked in 1999 in plot WG-11, as they did in most treated plots. Bare ground increased in all control plots in 2002, mostly due to loss of woody species cover.

Crush + seed

Plot WG-3 was a success story. The plot was dominated by mesquite (18% cover) and tarbush (12%) before treatment. Grass canopy cover (mostly plains bristlegrass) rose from 0.1% in 1996 to 29% in 2001, while woody cover dropped from 30% to 14%. Unfortunately the dry weather of 2002 caused a drop in grass canopy cover to 17%. Significant increases in grass canopy cover occurred in plot WG-7 by 2001 (12% to 19%), but in 2002 it fell back to the pre-treatment level. In WG-9 grass canopy cover dropped the first post-treatment year (2% to 0.5%), then rose to 8% by 2001. It did not drop in 2002. In WG-5 grass canopy cover did not change significantly over the time period, neither in response to the treatment nor to the 2002 drought.

Crush only

Results from the Crush only treatment suggest that the addition of seeds was important to increase grass cover. Only in plot WG-10 did grass canopy cover increase significantly relative to pre-treatment, from 6% in 1996 to 11% in 2001. By 2002 it had dropped back to 8%. In 1999 annual species rose from pre-treatment levels in all 4 plots, and dropped sharply in 2000 in 3 of 4 plots. In WG-2 annual plants did not spike as sharply in 1999 as the other 3 plots, but did spike in 2002, unlike the other 3 plots. The 2002 crop was tumbleweed, which was confined almost entirely to this single plot.

Rodeo (ER)

Control

All four Control plots showed significant, even dramatic, increases in perennial grass canopy cover over the study period, largely due to Lehmann's lovegrass (a species not included in the seed mixture). In ER-12, canopy cover of Lehmann's lovegrass went from 7% in 1996 to 32% in 2001, but in 2002 it dropped back to 21%. In 3 of 4 Control plots annual plant cover dropped sharply after a high value (40% or greater) in 1996; in 2002 there were almost no annuals in the Control plots. The exception was ER-2, which also differed from the other Control plots in having much more mesquite (about 20% cover).

Crush + seed

In contrast to the Control plots, only one of the Crush + seed plots (ER-9) showed a dramatic increase in Lehmann's and plains bristlegrass canopy cover, until 2002, when it dropped sharply. In this same plot the cover of annuals took a dive over the study period, from 72% to 18%. In 2002 the cover of annuals was very low in all plots, and bare ground increased to >50% cover.

Crush only

The Crush only plots behaved much like the Control plots with dramatic increases in Lehmann's lovegrass and plains bristlegrass from 1996 to 2001, with a drop in 2002. In plot ER-11 Lehmann's increased from 2% to 33%. Plot ER-7 was an exception: Lehmann's fluctuated from 1% in 1996 to 8% in 2000, falling back to 1% in 2001. As in all other plots at Rodeo, annual cover was very low in 2002 and bare ground increased accordingly.

George Wright (GW)

Control

Two of the Control plots at this site acted as one might expect: little change over the study period. However, plots GW-6 and GW-9 showed considerable fluctuations. From 1996 to 1999 in plot GW-6 total grass canopy cover went from 18% to 30%, then dropped back to 22% by 2001, and in GW-9 grass rose from 12% in 1996 to 24% in 1999, where it leveled off. Most of the increased grass cover in these 2 plots was due to *Aristida* (threeawns). No significant changes occurred in 2002.

Crush + seed

These plots generally showed steady increases in perennial grass canopy cover following treatment, especially in 2001. Much of the increased grass cover was species that first appeared in the record in 2001, including dropseeds, sideoats grama, plains lovegrass, Arizona cottontop, blue grama and green sprangletop. Grass cover dropped sharply in 2002 in GW-1, from 37% in 2001 to 20%. The other Crush + Seed plots did not change significantly.

Crush only

While these plots also showed increases in grass canopy cover, the final level was generally lower than in the Crush+seed treatments, suggesting that addition of seeds was helpful. Plot GW-2 showed a sharp increase in grass, mostly due to threeawns and Lehmann's lovegrass, the latter of which went from 0% in 1996 to 11% in 2001. In 2002 all grass species lost cover, but most especially Lehmann's lovegrass, which dropped from 11% to 3%. Most Crush only plots showed no significant changes between 2001 and 2002.

McDonald Ranch trampling experiment

This experiment would have to be judged a failure in achieving a reduction in mesquite cover and establishment of perennial grasses. In 2 of 4 treated plots the cover of woody species in 2002 was slightly higher than in the pre-treatment year of 1996, as it was in the control plot. Grass canopy cover increased slightly after treatment in plots MD-3 and MD-4, due mostly to bush muhly, which was not seeded. Further sampling of these plots seems unnecessary.

Interpreting graphs and tables

The summary tables for each plot present the average cover values of all species, with t-test P values. T-test P is the probability that the 2 sample means being compared are actually the same, any apparent difference being due to random factors rather than any true change in cover. For example, the t-test P = 0.09 for the comparison of Bare cover in plot ER-1 between 1996 and 1999, in which years the Bare cover values were 63.1 and

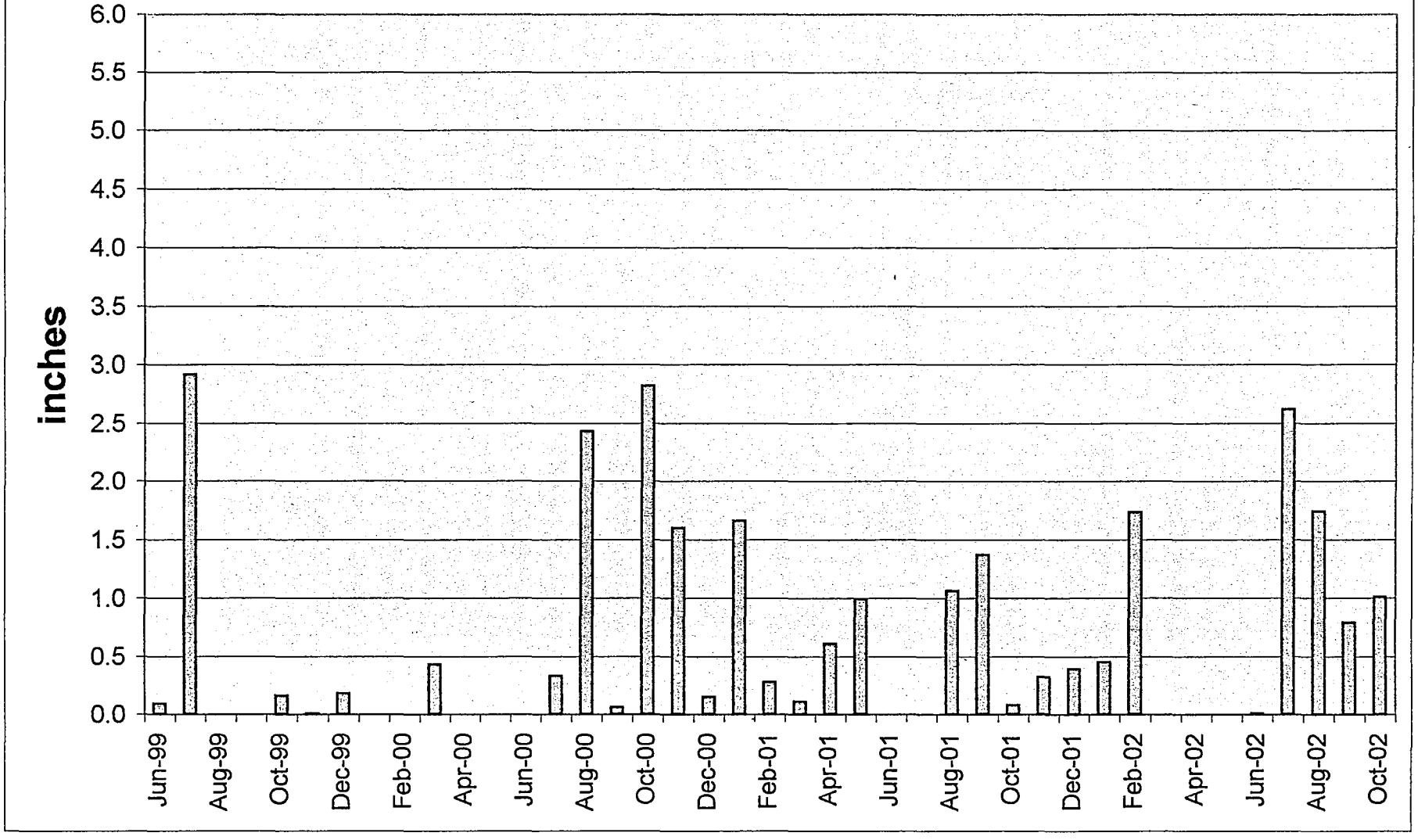
55.7. There is a 9% chance that the apparent difference of 7.4 percentage points was due to random variation, not real change. I generally accept that a real change has occurred whenever $P<0.20$, but other readers may prefer more confidence.

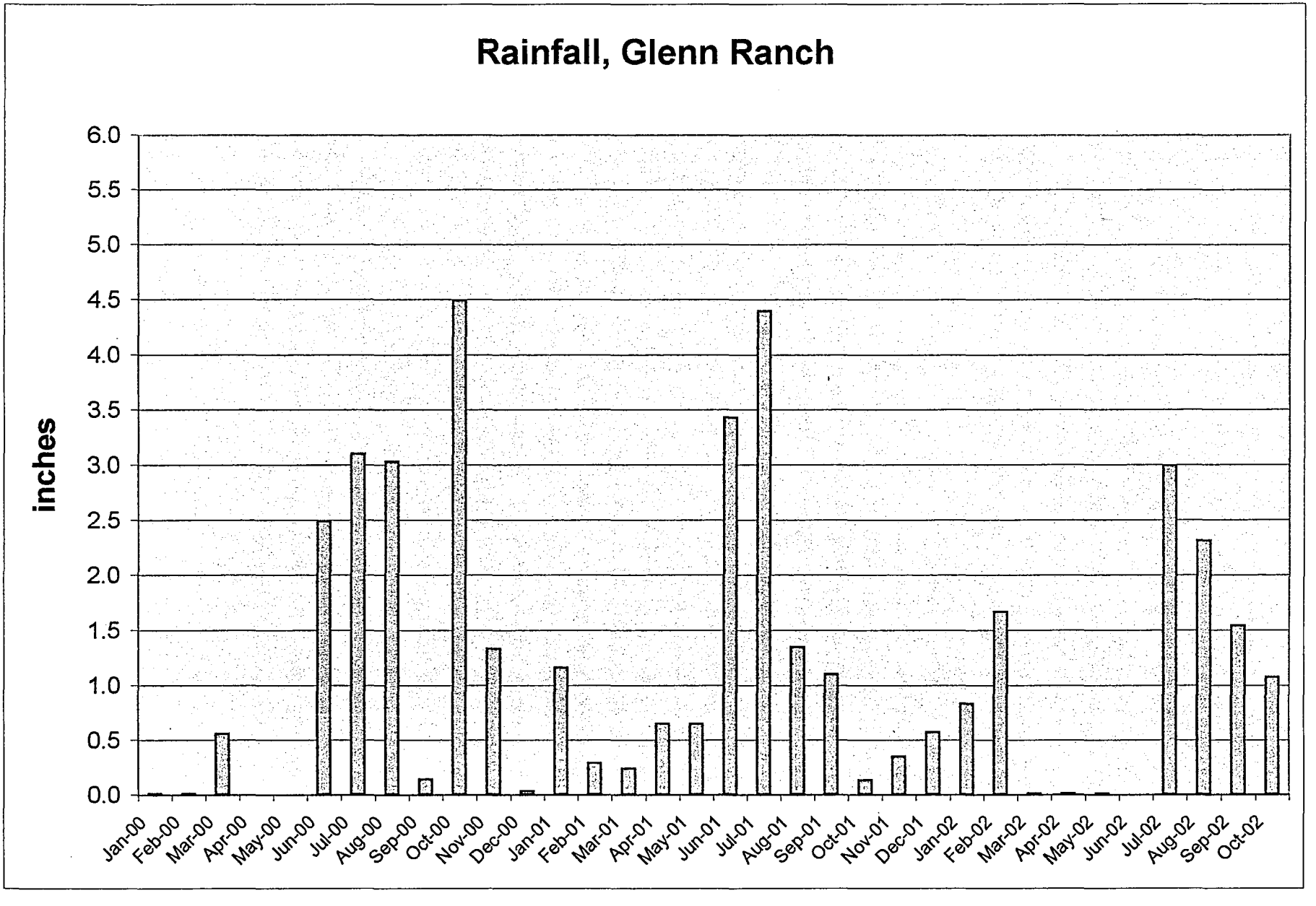
In the graphs several species have been lumped into functional groups to clarify and simplify the analyses. The functional groups are "All Basal", the summed basal covers of all perennial grasses, "All Canopy", the summed canopy covers of all perennial grasses, "Woody Spp", the summed covers of all woody species (including mesquite, whitethorn, tarbush, etc., but not including low shrubs like snakeweed, burroweed or *Ephedra*), and "Annuals", the summed covers of annual forbs and grasses. The graphs are arranged such that plots that received the same treatment are on the same page.

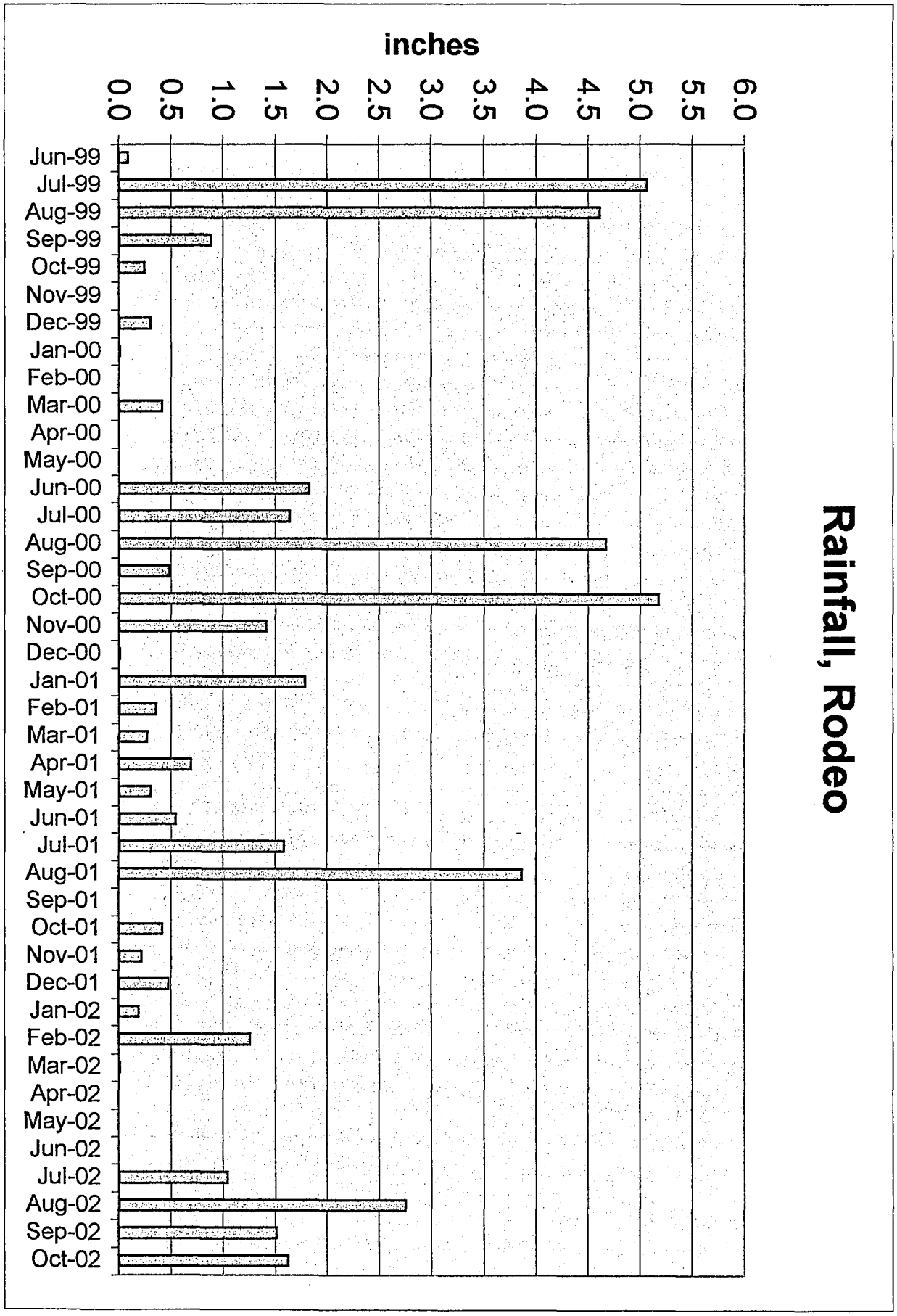
Acknowledgements
Fieldwork in 2002 was accomplished by Jan Fox Holl, Bill Wheelan, Matt Yarrow and Pete Sundt, with help from Myles Traphagen and Scott E. Carroll.

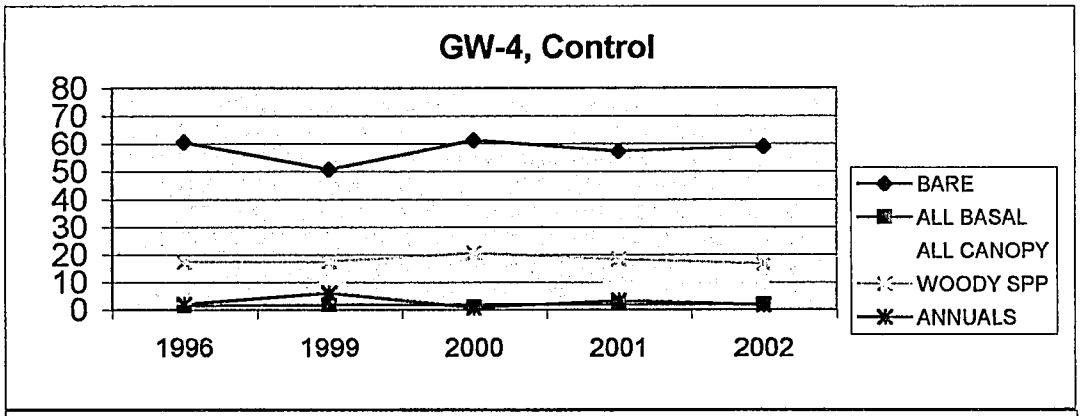
Rainfall, George Wright

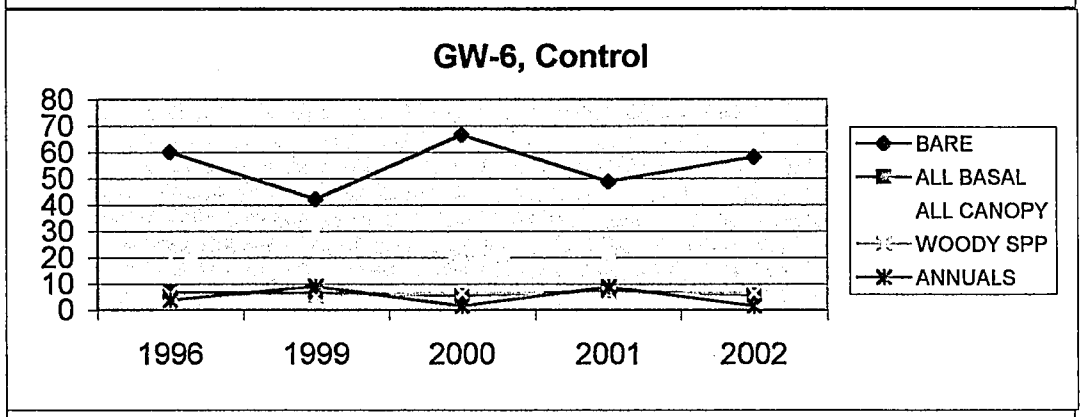
no data, 7/20-9/2/99, 6/1-7/15/00 and 6/4-8/5/01

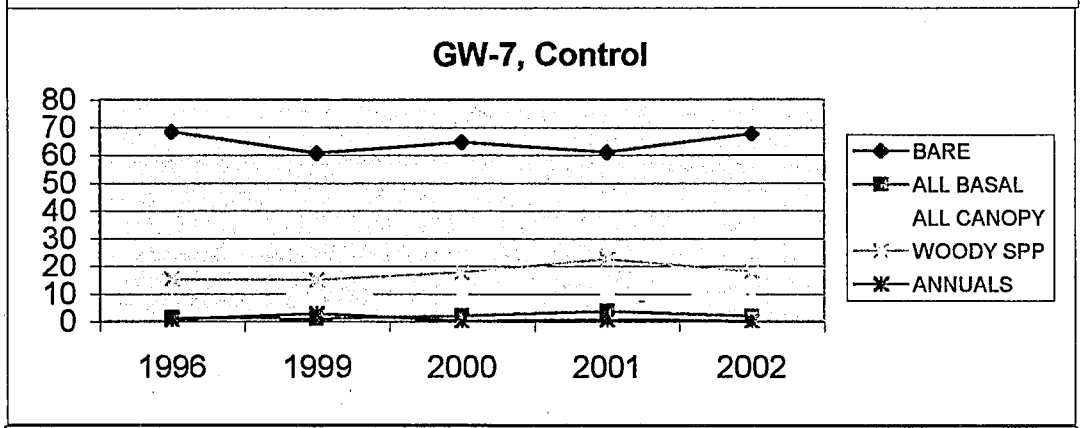


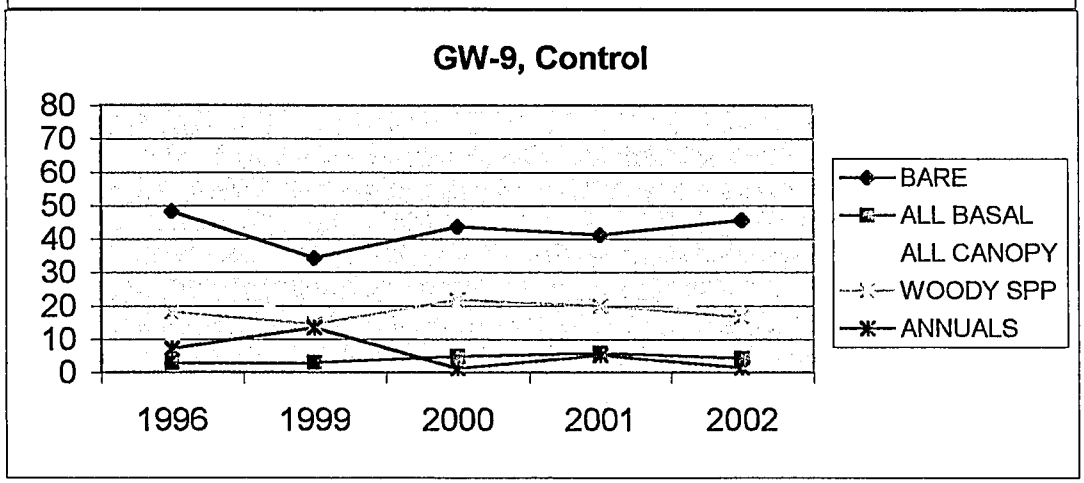

Rainfall, Glenn Ranch
inches
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
Jan-00
Feb-00
Mar-00
Apr-00
May-00
Jun-00
Jul-00
Aug-00
Sep-00
Oct-00
Nov-00
Dec-00
Jan-01
Feb-01
Mar-01
Apr-01
May-01
Jun-01
Jul-01
Aug-01
Sep-01
Oct-01
Nov-01
Dec-01
Jan-02
Feb-02
Mar-02
Apr-02
May-02
Jun-02
Jul-02
Aug-02
Sep-02
Oct-02


inches
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3.5
4.0
4.5
5.0
5.5
6.0
Jun-99
Jul-99
Aug-99
Sep-99
Oct-99
Nov-99
Dec-99
Jan-00
Feb-00
Mar-00
Apr-00
May-00
Jun-00
Jul-00
Aug-00
Sep-00
Oct-00
Nov-00
Dec-00
Jan-01
Feb-01
Mar-01
Apr-01
May-01
Jun-01
Jul-01
Aug-01
Sep-01
Oct-01
Nov-01
Dec-01
Jan-02
Feb-02
Mar-02
Apr-02
May-02
Jun-02
Jul-02
Aug-02
Sep-02
Oct-02
Rainfall, Rodeo


GW-4, Control
80
70
60
50
40
30
20
10
0
1996
1999
2000
2001
2002
BARE
ALL BASAL
ALL CANOPY
WOODY SPP
ANNUALS


GW-6, Control
80
70
60
50
40
30
20
10
0
1996
1999
2000
2001
2002
BARE
ALL BASAL
ALL CANOPY
WOODY SPP
ANNUALS


GW-7, Control
80
70
60
50
40
30
20
10
0
1996
1999
2000
2001
2002
BARE
ALL BASAL
ALL CANOPY
WOODY SPP
ANNUALS


GW-9, Control
80
70
60
50
40
30
20
10
0
1996
1999
2000
2001
2002
BARE
ALL BASAL
ALL CANOPY
WOODY SPP
ANNUALS

GW-1, Crush+seed	Means					t-test P			
	1996	1999	2000	2001	2002	96-99	96-00	96-01	96-02
SOIL		53.2	64.4	47.3	58.6				
ROCK		0.7	0.6	0.3	0.6				
BARE	54.7	53.9	65.0	47.3	59.2	0.92	0.17	0.30	0.56
LITTER	12.5	8.5	9.8	8.0	7.7	0.02	0.22	0.00	0.00
ANN FORB	8.4	11.8	1.2	6.7	2.6	0.32	0.03	0.61	0.08
ANN GRASS	2.7	12.3	5.2	0.2	0.2	0.06	0.29	0.14	0.51
PRGL	22.0	7.0	10.4	17.7	12.9	0.00	0.00	0.13	0.00
GUSA	1.0	0.3	0.1	0.5	0.1	0.17	0.08	0.35	0.08
SEMA BAS		1.2	1.5	2.3	2.5				
SEMA CAN	0.3	3.9	5.6	14.2	9.7	0.01	0.00	0.00	0.00
HODE	0.5	1.3	0.1	0.1	0.1	0.22	0.24	0.24	0.43
DESERT BROOM	0.2	0.0	0.1	0.0	0.0	0.34	0.66	0.34	0.34
BOBA BAS		0.3	0.3	0.0	0.0				
BOBA CAN	0.1	2.2	2.4	0.9	1.7	0.15	0.15	0.09	0.16
PAOB BASAL		0.0	0.0	0.2	0.2				
PAOB CANOPY	0.5	0.7	0.1	0.8	1.2	0.63	0.13	0.38	0.26
MUPO BAS		0.0	0.0	0.0	0.0				
MUPO CAN	0.2	0.0	0.0	0.0	0.0	0.17	0.17	0.17	0.56
SPSP	0.1	0.0	0.0	0.0	0.0	0.34	0.34	0.34	0.34
CRCO	0.2	0.0	0.0	0.2	0.2	0.17	0.17	1.00	0.17
BOCO	0.1	0.0	0.0	0.0	0.0	0.34	0.34	0.34	0.34
ACOU	0.1	0.0	0.0	0.0	0.0	0.34	0.34	0.34	0.34
ARIS BAS		0.1	0.4	0.3	0.3				
ARIS CANOPY	0.1	1.7	2.4	5.0	3.5	0.01	0.00	0.00	0.00
SOEL	0.3	0.0	0.0	0.2	0.2	0.19	0.19	0.70	0.19
ISTE	0.3	0.2	0.0	1.8	0.5	0.70	0.19	0.10	0.57
SILE	0.1	0.0	0.0	0.0	0.0	0.34	0.34	0.34	0.34
SCBR BAS		0.0	0.0	0.0	0.0				
SCBR CAN	0.1	0.0	0.0	0.0	0.0	0.34	0.34	0.34	1.00
STICKY FORB			0.9	0.1	0.1				
ERLE BAS				0.0	0.0				
ERLE CAN				2.9	0.0				
SPOR BAS				0.0	0.0				
SPOR CAN				0.7	0.4				
BOCU BAS				0.2	0.2				
BOCU CAN				0.8	0.4				
ERIN BAS				0.6	0.2				
ERIN CAN				4.8	2.2				
DICA BAS				0.7	0.2				
DICA CAN				5.1	0.3				
BOGR CAN				1.1	0.2				
LEDU CAN				0.8	0.3				
ALL BASAL	0.0	1.6	2.2	4.6	4.0	0.01	0.00	0.00	0.00
ALL CANOPY	1.3	8.5	10.5	36.8	19.8	0.01	0.00	0.00	0.00
WOODY SPP	22.2	7.0	10.5	17.7	12.9	0.00	0.00	0.12	0.00
ANNUALS	11.1	24.1	6.4	6.9	4.1	0.07	0.32	0.38	0.14

GW-2, Crush only	Means					t-test P			
	1996	1999	2000	2001	2002	96-99	96-00	96-01	96-02
SOIL		41.4	47.6	35.2	50.9				
ROCK		1.3	0.8	0.4	1.1				
BARE	45.3	42.7	48.4	35.6	52.0	0.51	0.42	0.00	0.13
LITTER	11.9	6.1	10.6	12.4	10.3	0.00	0.47	0.79	0.44
ANN FORB	4.3	21.4	1.4	4.5	0.8	0.00	0.01	0.87	0.00
ANN GRASS	2.6	11.2	4.2	0.0	0.0	0.01	0.20	0.01	0.23
PRGL	23.0	5.6	10.2	11.5	10.7	0.00	0.00	0.00	0.00
GUSA	2.3	1.2	0.7	1.6	0.5	0.06	0.01	0.30	0.00
SEMA BAS		0.4	1.7	2.5	2.0				
SEMA CAN	0.1	3.1	6.0	8.4	6.0	0.02	0.00	0.00	0.00
HODE	0.0	0.1	0.0	0.0	0.0	0.34			
BOBA BAS		0.8	0.4	0.0	0.2				
BOBA CAN	0.2	0.2	2.1	0.0	1.4	1.00	0.03	0.34	0.14
PAOB BASAL		0.0	0.0	0.4	0.1				
PAOB CANOPY	0.1	1.1	0.7	2.4	1.1	0.03	0.02	0.01	0.05
SPSP	0.3	0.0	0.0	0.0	0.0	0.19	0.19	0.19	0.19
CRCO	2.6	1.0	1.5	2.5	2.0	0.16	0.30	0.93	0.58
BOCO	0.0	0.0	0.0	0.0	0.0				
ACOU	0.0	0.0	0.0	0.0	0.0				
ARIS BAS		0.8	1.7	2.6	1.8				
ARIS CANOPY	2.4	6.8	10.1	11.9	10.5	0.02	0.00	0.00	0.00
SOEL	0.5	0.5	0.1	0.0	0.1	1.00	0.13	0.05	0.13
ISTE	0.0	0.0	0.3	0.1	0.0		0.19	0.34	
SILE	0.0	0.0	0.0	0.0	0.0				
SCBR BAS		0.0	0.0	0.0	0.0				
SCBR CAN	0.1	0.0	0.0	0.0	0.0	0.34	0.34	0.34	0.34
ZIGR	0.5	1.5	0.7	0.8	0.4	0.12	0.47	0.33	0.75
HIMU CAN	0.1	0.1	0.1	0.0	0.7	1.00	1.00	0.34	0.02
ERLE BAS		0.5	0.5	2.7	0.6				
ERLE CAN		2.6	5.5	10.8	3.2				
DICA BAS				0.0	0.0				
DICA CAN				0.7	0.4				
ALL BASAL		2.5	4.3	8.3	4.7				
ALL CANOPY	3.0	13.9	24.5	34.2	23.3	0.00	0.00	0.00	0.00
WOODY SPP	23.0	5.6	10.2	11.5	10.7	0.00	0.00	0.00	0.00
ANNUALS	6.9	32.6	5.6	4.5	2.1	0.00	0.44	0.13	0.00

GW-3, Crush only	Means					t-test P			
	1996	1999	2000	2001	2002	96-99	96-00	96-01	96-02
SOIL		53.4	76.7	56.9	62.3				
ROCK		1.7	0.7	1.0	1.7				
BARE	65.1	55.1	77.4	57.9	64.0	0.01	0.00	0.06	0.72
LITTER	9.9	8.3	7.7	9.8	9.0	0.23	0.13	0.95	0.51
FORB	1.0	22.5	0.6	6.1	2.4	0.00	0.50	0.00	0.13
PRGL	16.4	2.1	4.4	6.0	7.7	0.00	0.00	0.00	0.00
GUSA	0.5	0.0	0.1	0.5	1.2	0.01	0.06	1.00	0.05
SEMA BAS	0.0	0.3	1.8	1.8	1.6	0.08	0.00	0.01	0.00
SEMA CAN	0.2	1.0	3.9	6.6	4.6	0.12	0.00	0.00	0.00
DAPU CAN	0.1	0.3	0.3	1.4	1.8	0.54	0.29	0.00	0.00
HIMU BAS	0.2	0.0	0.0	0.1	0.2	0.34	0.34	0.66	1.00
HIMU CAN	0.5	0.2	0.1	0.3	0.3	0.59	0.45	0.72	0.72
PAOB BAS	0.2	0.4	0.6	0.6	0.4	0.45	0.25	0.14	0.36
PAOB CAN	0.3	3.0	1.7	1.4	2.6	0.00	0.07	0.03	0.00
CRCO	2.1	2.3	0.9	3.0	2.9	0.82	0.05	0.26	0.48
ARIS BAS	0.8	0.7	0.0	0.7	0.6	0.84	0.09	0.83	0.68
ARIS CAN	2.0	2.0	2.0	4.0	4.7	0.91	0.12	0.02	0.03
EVOL	0.1	0.0	0.0	0.1	0.0	0.34	0.34	1.00	0.34
MUPO BAS	0.0	0.0	0.0	0.0	0.0				
MUPO CAN	0.4	0.0	0.0	0.0	0.0	0.10	0.10	0.10	0.10
ISTE	0.2	0.0	0.1	0.1	0.0	0.17	0.56	0.56	0.17
SILE	0.1	0.0	0.0	0.0	0.0	0.34	0.34	0.34	0.34
ACOU	0.1	0.0	0.0	0.0	0.0	0.34	0.34	0.34	0.34
SOEL	0.1	0.0	0.0	0.0	0.0	0.34	0.34	0.34	0.34
ASTER	0.1	0.1	0.0	0.2	0.0	1.00	0.34	0.56	0.34
ANN GRASS		0.6	0.4	0.1	0.0				
ZINNIA		1.0	0.3	0.5	0.4				
ERLE BAS				0.1	0.0				
ERLE CAN				0.3	0.3				
ALL BASAL	1.2	1.4	2.4	3.3	2.8	0.74	0.10	0.03	0.06
ALL CANOPY	3.4	6.3	6.7	12.6	12.5	0.08	0.05	0.00	0.00
WOODY SPP	16.4	2.1	4.4	6.0	7.7	0.00	0.00	0.00	0.00
ANNUALS	1.0	23.1	1.0	6.2	2.4	0.00	1.00	0.00	0.13

GW-4, Control	Means					t-test P			
	1996	1999	2000	2001	2002	96-99	96-00	96-01	96-02
SOIL		49.8	60.4	55.9	58.5				
ROCK		0.9	0.8	1.4	0.5				
BARE	60.6	50.7	61.2	57.3	59.0	0.02	0.87	0.38	0.53
LITTER	10.9	10.1	10.4	8.9	7.7	0.67	0.75	0.23	0.07
ANN FORB	1.4	5.5	0.2	3.2	1.6	0.01	0.08	0.15	0.81
ANN GRASS	0.5	0.5	0.5	0.0	0.1	1.00	1.00	0.14	0.24
PRGL	17.2	17.3	20.3	18.2	16.5	0.97	0.39	0.78	0.79
GUSA	0.3	0.7	0.1	0.6	0.5	0.21	0.29	0.44	0.47
DAPU BAS	0.1	0.4	0.2	0.1	0.0	0.34	0.34	1.00	0.34
DAPU CAN	0.2	0.3	0.0	0.8	0.2	0.51	1.00	0.14	1.00
PAOB BAS	0.2	0.3	0.0	0.1	0.5	0.63	0.17	0.56	0.43
PAOB CAN	0.5	1.8	0.5	0.8	2.1	0.21	1.00	0.49	0.21
CRCO	3.7	4.9	2.1	2.3	3.1	0.33	0.07	0.09	0.47
ARIS BAS	1.0	1.5	1.9	1.9	1.4	0.20	0.10	0.08	0.49
ARIS CAN	3.8	7.4	5.6	7.6	7.9	0.02	0.25	0.04	0.05
ACOU	0.1	0.0	0.0	0.0	0.0	0.34	0.34	0.34	0.34
SOEL	0.2	0.1	0.1	0.0	0.0	0.56	0.56	0.17	0.17
ASTER	0.1	0.7	0.0	0.2	0.0	0.20	0.34	0.56	0.34
HODE	0.2	0.1	0.0	0.0	0.0	0.56	0.17	0.17	0.17
ZIGR	0.5	0.8	0.1	0.3	0.5	0.42	0.13	0.47	1.00
BAHIA	0.1	0.0	0.0	0.0	0.1	0.34	0.34	0.34	1.00
SPSP	0.1	0.3	0.0	0.1	0.0	0.41	0.34	1.00	0.34
MUAR	0.1	0.1	0.0	0.0	0.0	1.00	0.34	0.34	0.34
BOCU	0.1	0.0	0.0	0.0	0.3	0.34	0.34	0.34	0.29
TAAU	0.1	0.0	0.0	0.0	0.1	0.34	0.34	0.34	1.00
ERLE CAN	0.1	0.1	0.1	0.1	0.0	1.00	1.00	1.00	0.34
KRLA	0.1	0.0	0.0	0.0	0.0	0.34	0.34	0.34	0.34
SCBR	0.1	0.0	0.2	0.1	0.0	0.34	0.66	1.00	0.34
SEMA CAN				0.4	0.2				
ALL BASAL	1.3	1.8	1.9	2.1	1.9	0.40	0.32	0.20	0.48
ALL CANOPY	4.6	9.7	6.4	9.7	10.4	0.03	0.27	0.02	0.04
WOODY SPP	17.2	17.3	20.3	18.2	16.5	0.97	0.39	0.78	0.79
ANNUALS	1.9	6.0	0.7	3.2	1.7	0.02	0.21	0.33	0.84

GW-5, Crush+seed	Means					t-test P			
	1996	1999	2000	2001	2002	96-99	96-00	96-01	96-02
SOIL		52.3	70.9	53.4	61.1				
ROCK		0.7	0.0	0.7	1.5				
BARE	63.8	53.0	70.9	54.1	62.6	0.00	0.01	0.00	0.74
LITTER	9.3	6.5	7.7	6.4	5.9	0.08	0.32	0.10	0.04
FORB	1.9	13.0	0.7	6.9	3.2	0.00	0.05	0.00	0.20
PRGL	9.9	3.4	6.3	7.0	7.3	0.00	0.04	0.14	0.15
PAOB BAS	0.4	1.0	1.3	0.4	0.5	0.31	0.11	1.00	0.78
PAOB CAN	1.8	5.2	4.3	1.2	3.1	0.04	0.07	0.50	0.20
ARIS BAS	1.0	0.1	0.5	1.2	1.0	0.01	0.12	0.67	1.00
ARIS CAN	3.6	3.8	2.6	7.3	5.7	0.84	0.27	0.00	0.04
CRCO	3.7	4.3	1.6	1.6	1.9	0.55	0.03	0.04	0.09
HIMU BAS	0.1	0.0	0.1	0.0	0.0	0.34	1.00	0.34	0.34
HIMU CAN	0.1	0.0	0.1	0.0	0.0	0.34	1.00	0.34	0.34
HODE	0.1	0.2	0.0	0.0	0.1	0.56	0.34	0.34	1.00
BOCU BAS	0.6	0.5	0.5	0.5	0.3	0.75	0.78	0.72	0.28
BOCU CAN	1.5	1.3	1.3	2.2	2.5	0.74	0.79	0.33	0.20
MUAR BAS	0.5	0.3	0.0	0.5	0.3	0.47	0.05	1.00	0.47
MUAR CAN	1.2	0.9	0.4	1.0	1.1	0.57	0.13	0.77	0.87
SILE	0.2	0.1	0.0	0.0	0.0	0.56	0.17	0.17	0.17
EVOL	0.1	0.2	0.0	0.3	0.0	0.56	0.34	0.41	0.34
BOER BAS	0.1	0.2	0.1	0.2	0.4	0.56	1.00	0.56	0.37
BOER CAN	0.5	0.5	0.1	0.7	1.4	1.00	0.24	0.65	0.18
TAAU	0.3	0.0	0.0	0.4	0.1	0.08	0.08	0.71	0.29
GUSA	0.7	0.7	0.2	0.4	0.7	1.00	0.07	0.34	1.00
DAPU BAS	0.3	0.2	0.0	0.4	0.1	0.74	0.19	0.77	0.41
DAPU CAN	0.6	0.8	0.3	1.1	1.6	0.68	0.52	0.30	0.16
ANN GRAS	0.5	2.3	1.2	0.0	0.0	0.06	0.23	0.05	0.05
SCBR CAN	0.1	0.5	0.1	0.2	0.3	0.29	1.00	0.56	0.41
SEMA BAS	0.0	0.4	0.5	0.9	0.5	0.17	0.01	0.09	0.05
SEMA CAN	0.2	1.2	2.2	4.5	3.7	0.04	0.00	0.00	0.00
ZIGR	0.3	1.2	0.1	0.5	0.3	0.08	0.25	0.67	0.90
ASTER	0.4	1.1	0.0	0.0	0.2	0.09	0.04	0.04	0.36
MUPO BAS	0.0	0.0	0.0	0.0	0.0				
MUPO CAN	0.1	0.0	0.0	0.1	0.0	0.34	0.34	1.00	0.34
SPFL CAN	0.1	0.0	0.0	0.0	0.0	0.34	0.34	0.34	0.34
ACOU	0.1	0.0	0.0	0.0	0.2	0.34	0.34	0.34	0.56
SOEL	0.3	0.0	0.0	0.0	0.0	0.19	0.19	0.19	0.19
ERWR				2.5	0.0				
BOGR BAS				0.5	0.2				
BOGR CAN				1.2	0.7				
LEDU CAN				0.3	0.0				
ERLE CAN				0.4	0.1				
ALL BASAL	3.0	2.7	3.0	4.6	3.3	0.81	1.00	0.22	0.81
ALL CANOPY	9.6	13.7	11.3	19.3	19.8	0.22	0.58	0.01	0.01
WOODY SPP	9.9	3.4	6.3	7.0	7.3	0.00	0.04	0.14	0.15
ANNUALS	2.4	15.3	1.9	6.9	3.2	0.00	0.56	0.01	0.42

GW-6, Control	Means					t-test P			
	1996	1999	2000	2001	2002	96-99	96-00	96-01	96-02
SOIL		41.4	65.7	47.8	56.9				
ROCK		0.8	0.9	0.9	1.1				
BARE	60.1	42.2	66.6	48.7	58.0	0.00	0.07	0.00	0.55
LITTER	8.8	8.8	5.9	4.5	6.1	1.00	0.01	0.00	0.01
PRGL	6.0	5.3	6.6	6.4	6.7	0.73	0.80	0.85	0.73
ANN FORB	3.2	8.8	0.8	8.6	1.2	0.00	0.00	0.04	0.01
ARIS BAS	3.8	3.8	3.6	4.6	2.8	1.00	0.84	0.37	0.28
ARIS CANOPY	11.9	19.9	13.5	15.9	11.9	0.01	0.40	0.09	1.00
CRCO	3.0	5.1	1.7	2.3	2.7	0.03	0.16	0.50	0.74
EVOL	0.4	0.1	0.1	0.1	0.6	0.24	0.24	0.24	0.57
BOER BAS	1.6	1.7	0.6	1.4	1.5	0.87	0.10	0.78	0.88
BOER CAN	3.8	4.9	3.0	3.7	6.6	0.35	0.47	0.95	0.08
ANN GRAS	0.4	0.2	0.6	0.1	0.3	0.45	0.57	0.24	0.75
SILE	0.6	0.2	0.0	0.0	0.3	0.20	0.05	0.05	0.46
HODE	0.2	0.5	0.1	0.4	0.1	0.34	0.56	0.36	0.56
SPSP	0.1	0.1	0.0	0.1	0.0	1.00	0.34	1.00	0.34
MUAR BAS	0.4	0.6	0.4	0.5	0.2	0.48	1.00	0.75	0.51
MUAR CAN	0.7	1.8	0.7	0.7	1.5	0.02	1.00	1.00	0.23
PAOB BAS	0.2	0.2	0.1	0.4	0.8	1.00	0.56	0.45	0.11
PAOB CAN	0.6	1.9	1.1	0.9	3.2	0.06	0.39	0.56	0.01
MUPO BAS	0.0	0.0	0.0	0.0	0.0				
MUPO CAN	0.3	0.0	0.0	0.4	0.0	0.34	0.34	0.82	0.34
ZIGR	0.3	1.0	0.2	0.0	0.9	0.14	0.70	0.19	0.10
DAPU BAS	0.1	0.1	0.3	0.2	0.0	1.00	0.29	0.56	0.34
DAPU CAN	0.1	0.2	0.5	0.3	0.4	0.56	0.24	0.41	0.24
SOEL	0.1	0.0	0.2	0.0	0.1	0.34	0.66	0.34	1.00
GUSA	0.2	0.2	0.0	0.2	0.1	1.00	0.17	1.00	0.56
TAAU	0.1	0.0	0.0	0.2	0.1	0.34	0.34	0.56	1.00
BOGR BAS	0.1	0.1	0.1	0.0	0.1	1.00	1.00	0.34	1.00
BOGR CAN	0.2	0.1	0.1	0.1	0.3	0.66	0.66	0.66	0.79
SCBR BAS	0.3	0.4	0.2	0.1	0.3	0.81	0.77	0.54	1.00
SCBR CAN	0.6	0.8	0.5	0.1	0.7	0.73	0.84	0.28	0.86
SEMA CAN				0.5	0.1				
ALL BASAL	6.5	6.9	5.3	7.2	5.7	0.79	0.41	0.64	0.58
ALL CANOPY	18.2	29.6	19.4	22.1	24.6	0.00	0.70	0.29	0.07
WOODY SPP	6.0	5.3	6.6	6.4	6.7	0.73	0.80	0.85	0.73
ANNUALS	3.6	9.0	1.4	8.7	1.5	0.00	0.00	0.04	0.01

GW-7, Control	Means					t-test P			
	1996	1999	2000	2001	2002	96-99	96-00	96-01	96-02
SOIL		59.1	63.9	60.8	67.4				
ROCK		1.6	0.7	0.2	0.2				
BARE	68.3	60.7	64.6	61.0	67.6	0.04	0.36	0.03	0.83
LITTER	8.2	10.7	8.2	6.2	5.8	0.07	1.00	0.12	0.07
PRGL	15.1	14.9	17.7	22.3	18.0	0.93	0.42	0.02	0.29
ANN FORB	0.5	2.6	0.1	0.5	0.1	0.00	0.06	1.00	0.06
ARIS BAS	0.8	0.5	0.1	1.3	1.1	0.38	0.30	0.25	0.47
ARIS CANOPY	2.0	4.9	1.3	3.5	4.1	0.02	0.03	0.20	0.02
MUPO BAS	0.0	0.1	0.2	0.2	0.0	0.34	0.17	0.17	
MUPO CAN	1.0	0.7	1.0	0.4	0.4	0.59	1.00	0.25	0.25
GUSA	0.7	0.9	0.2	0.6	0.3	0.65	0.15	0.79	0.26
PAOB BAS	0.2	0.1	0.2	0.8	0.3	0.56	1.00	0.20	0.63
PAOB CAN	1.4	1.8	0.6	1.9	1.5	0.64	0.27	0.53	0.91
CRCO	2.0	0.5	0.5	0.2	0.4	0.01	0.03	0.00	0.01
SILE	0.3	0.1	0.0	0.0	0.0	0.29	0.08	0.08	0.08
SEMA BAS	0.2	0.1	0.0	0.6	0.1	0.56	0.17	0.14	0.56
SEMA CAN	0.8	0.5	1.6	2.1	0.7	0.42	0.26	0.08	0.82
HIMU BAS	0.0	0.1	0.2	0.1	0.0	0.34	0.17	0.34	
HIMU CAN	0.4	0.6	0.7	0.1	0.4	0.71	0.63	0.37	1.00
ISTE	0.1	0.9	0.6	1.0	0.4	0.02	0.06	0.00	0.14
SOEL	0.1	0.0	0.0	0.0	0.0	0.34	0.34	0.34	0.34
POOB	0.1	0.0	0.0	0.0	0.0	0.34	0.34	0.34	0.34
ZIGR	0.3	0.2	0.2	0.4	0.2	0.63	0.70	0.66	0.70
ANN GRAS	0.1	0.2	0.2	0.1	0.0	0.66	0.56	1.00	0.34
DAPU BAS	0.1	0.0	0.1	0.3	0.1	0.34	1.00	0.41	1.00
DAPU CAN	0.2	0.6	0.4	0.2	0.1	0.39	0.45	1.00	0.66
SCBR BAS				0.3	0.3				
ALL BASAL	1.3	0.9	2.0	3.6	1.9	0.50	0.31	0.01	0.37
ALL CANOPY	7.1	10.0	10.8	11.8	9.1	0.27	0.20	0.09	0.44
WOODY SPP	15.1	14.9	17.7	22.3	18.0	0.93	0.42	0.02	0.29
ANNUALS	0.6	2.8	0.3	0.6	0.1	0.00	0.28	1.00	0.06

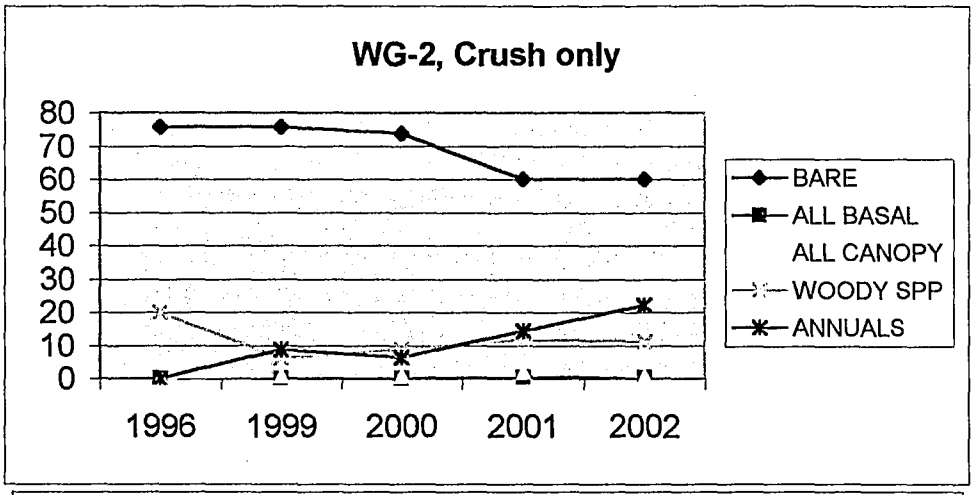
GW-8, Crush only	Means					t-test P			
	1996	1999	2000	2001	2002	96-99	96-00	96-01	96-02
SOIL		42.7	59.8	38.6	47.7				
ROCK		0.3	0.3	0.4	0.3				
BARE	52.9	43.0	60.1	39.0	48.0	0.01	0.10	0.00	0.22
LITTER	10.3	10.2	7.7	5.6	7.5	0.94	0.03	0.00	0.01
PRGL	17.1	4.4	6.3	11.3	11.3	0.00	0.00	0.01	0.01
ANN FORB	3.7	24.7	2.1	3.9	1.0	0.00	0.10	0.87	0.01
ANN GRAS	0.2	1.1	0.9	0.0	0.1	0.02	0.15	0.34	0.66
ARIS BAS	2.3	1.3	2.3	6.2	4.4	0.09	1.00	0.00	0.03
ARIS CANOPY	12.3	9.7	15.9	23.6	22.6	0.34	0.21	0.00	0.01
SEMA BAS	0.3	0.4	1.3	2.1	1.1	0.66	0.04	0.01	0.07
SEMA CAN	0.7	1.4	4.2	5.2	4.8	0.27	0.00	0.00	0.00
CRCO	2.8	2.9	2.4	4.4	5.0	0.91	0.61	0.12	0.09
GUSA	1.4	1.6	1.2	3.8	1.5	0.75	0.72	0.01	0.89
SPSP	0.3	0.1	0.0	0.1	0.0	0.29	0.08	0.29	0.08
ERWR	0.7	0.5	0.1	0.7	0.2	0.53	0.05	1.00	0.11
SCBR BAS	0.1	0.0	0.0	0.0	0.1	0.34	0.34	0.34	1.00
SCBR CAN	0.3	0.0	0.1	0.0	0.2	0.19	0.41	0.19	0.74
ISTE	0.5	0.3	0.8	0.5	0.5	0.53	0.66	1.00	1.00
SOEL	0.1	0.1	0.0	0.1	0.1	1.00	0.34	1.00	1.00
ASTER	0.6	0.7	0.0	0.2	0.1	0.84	0.08	0.25	0.15
EVOL	0.3	0.0	0.1	0.0	0.0	0.19	0.41	0.19	0.19
SPFL BAS	0.0	0.0	0.0	0.0	0.0				
SPFL CAN	0.1	0.0	0.0	0.0	0.0	0.34	0.34	0.34	0.34
MUPO BAS	0.0	0.1	0.0	0.0	0.0	0.34			
MUPO CAN	0.6	0.1	0.0	0.0	0.0	0.25	0.17	0.17	0.17
BRDE	0.1	0.0	0.0	0.0	0.0	0.34	0.34	0.34	0.34
DECO	0.1	0.0	0.0	0.0	0.0	0.34	0.34	0.34	0.34
ZIGR	1.3	1.6	0.9	0.0	1.9	0.54	0.42	0.00	0.33
DICA BAS				0.5	0.2				
DICA CAN				1.0	0.7				
ALL BASAL	2.7	1.8	3.6	8.4	5.8	0.21	0.32	0.00	0.02
ALL CANOPY	14.0	11.2	20.2	29.8	28.3	0.39	0.09	0.00	0.00
WOODY SPP	17.1	4.4	6.3	11.3	11.3	0.00	0.00	0.01	0.01
ANNUALS	3.9	25.8	3.0	3.9	1.1	0.00	0.40	1.00	0.01

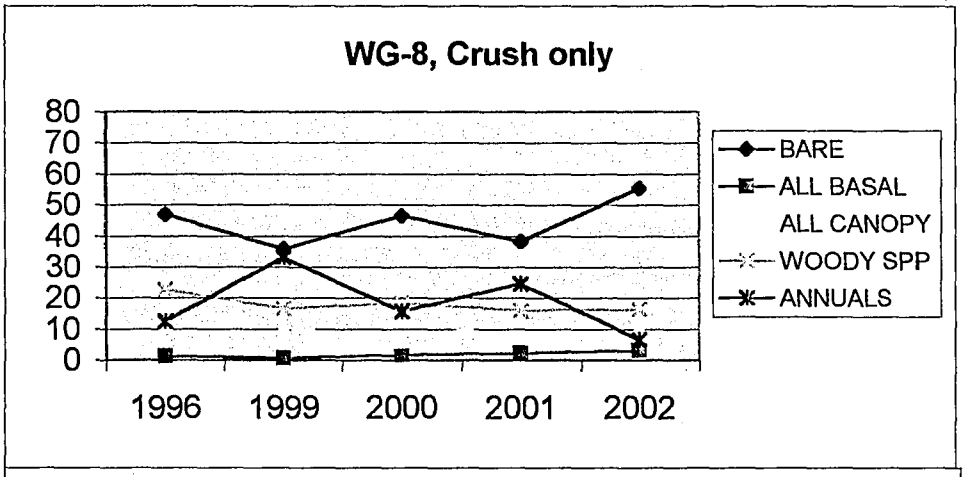
GW-9, Control	Means					t-test P			
	1996	1999	2000	2001	2002	96-99	96-00	96-01	96-02
SOIL		33.6	43.6	40.7	45.2				
ROCK		0.6	0.1	0.5	0.3				
BARE	48.2	34.2	43.7	41.2	45.5	0.01	0.33	0.14	0.58
LITTER	10.5	12.5	13.1	9	15.1	0.28	0.17	0.44	0.03
PRGL	17.7	14.2	21.7	19.7	16.5	0.27	0.26	0.62	0.71
ANN FORB	6.4	9.1	0.6	5.1	0.9	0.06	0.00	0.39	0.00
BRDE	1.4	0	0	0	0	0.03	0.03	0.03	0.03
CRCO	2.4	1.3	1.3	0.7	1.5	0.03	0.01	0.00	0.15
ARIS BAS	2.2	2.3	3.8	4.5	3.1	0.88	0.09	0.00	0.26
ARIS CANOPY	9.8	20.9	16.3	16.5	12.6	0.00	0.01	0.00	0.14
ZIGR	1.2	2.1	1.3	0.4	1.3	0.08	0.84	0.09	0.82
SOEL	0.4	0	0.1	0	0	0.04	0.14	0.04	0.04
BOGR BAS	0.1	0	0	0.1	0	0.34	0.34	1.00	0.34
BOGR CAN	0.2	0	0.1	0.2	0.1	0.34	0.66	1.00	0.66
GUSA	0.6	2.2	1.6	2.3	0.9	0.01	0.02	0.02	0.41
ASTER	0.2	0.1	0	0	0.1	0.56	0.17	0.17	0.56
SPSP	0.2	0.1	0	0.1	0	0.56	0.17	0.56	0.17
MIBI	0.3	0.1	0	0.1	0	0.29	0.08	0.29	0.08
SCBR BAS	0	0.1	0	0.1	0	0.34		0.34	
SCBR CAN	0.1	0.1	0	0	0	1.00	0.34	0.34	0.34
EVOL	0.4	0.2	0	0.2	0	0.36	0.04	0.36	0.04
BOCU BAS	0.2	0.1	0.3	0.5	0.6	0.56	0.70	0.39	0.20
BOCU CAN	0.6	1.1	1.1	1.5	1.8	0.41	0.47	0.09	0.11
MUPO BAS	0	0	0	0	0				
MUPO CAN	0.4	0	0.3	0	0.2	0.10	0.79	0.10	0.45
MUAR BAS	0	0	0.1	0.1	0.2		0.34	0.34	0.34
MUAR CAN	0.1	0	0.1	0.3	0.2	0.34	1.00	0.29	0.66
ANN GRAS	0.7	4.3	0.5	0	0.5	0.02	0.53	0.01	0.47
ERLE BAS	0	0	0	0.3	0.1			0.19	0.34
ERLE CAN	0.1	0	0.6	0.8	1	0.34	0.15	0.15	0.13
ISTE	0.2	0.1	0.2	0.2	0	0.66	1.00	1.00	0.34
HIMU BAS	0	0	0	0	0				
HIMU CAN	0.1	0	0	0	0	0.34	0.34	0.34	0.34
EPHEDRA	0.1	0.1	0	0.1	0	1.00	0.34	1.00	0.34
SEMA BAS	0	0.4	0.5	0.2	0.2	0.04	0.01	0.34	0.17
SEMA CAN	0.3	1.4	1.6	3.4	1.9	0.11	0.03	0.01	0.00
BOER BAS	0.1	0	0	0	0	0.34	0.34	0.34	0.34
BOER CAN	0.1	0.1	0	0.1	0	1.00	0.34	1.00	0.34
ERWR	0.2	1.5	0.3	0.7	0.8	0.01	0.63	0.23	0.11
ALL BASAL	2.6	2.9	4.7	5.8	4.2	0.71	0.06	0.00	0.09
ALL CANOPY	11.8	23.6	20.1	22.8	17.8	0.00	0.02	0.00	0.02
WOODY SPP	18	14.3	21.7	19.8	16.5	0.24	0.29	0.65	0.64
ANNUALS	7.1	13.4	1.1	5.1	1.4	0.00	0.00	0.17	0.00

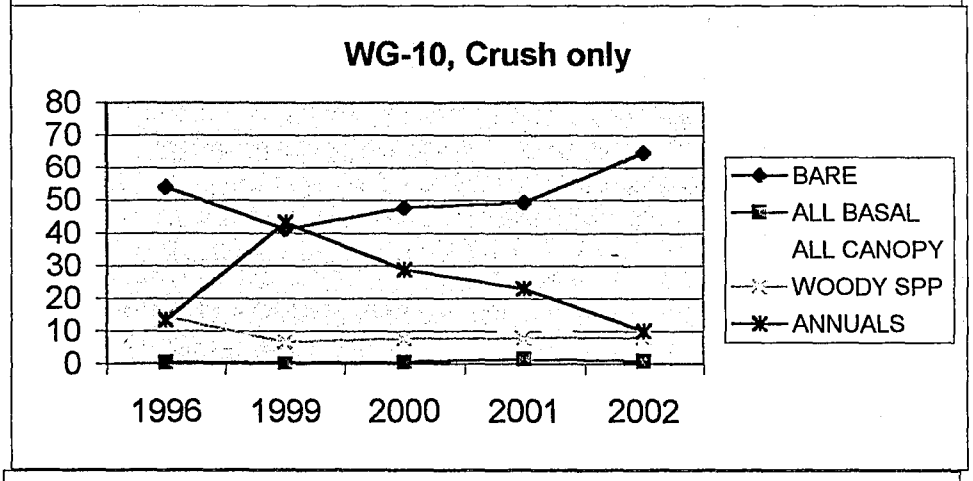
GW-10, Crush+seed	Means					t-test P			
	1996	1999	2000	2001	2002	96-99	96-00	96-01	96-02
SOIL		43.4	53.5	38.7	41.7				
ROCK		0.2	0.5	0.2	0.2				
BARE	55.3	43.6	54	38.9	41.9	0.01	0.77	0.00	0.00
LITTER	13.4	9.3	9.7	10.4	10.6	0.01	0.04	0.04	0.17
PRGL	23	4.8	9.9	11.6	11.9	0.00	0.00	0.00	0.00
ANN FORB	2	16.8	1.1	8.5	2.6	0.00	0.21	0.00	0.51
CRCO	2.2	2.4	1.8	1.1	1.2	0.74	0.44	0.03	0.06
ARIS BAS	1	1.2	1.8	1.7	1.7	0.68	0.14	0.34	0.23
ARIS CANOPY	4.4	8.3	9.8	10.2	10.7	0.12	0.02	0.00	0.00
EVOL	0.1	0.1	0	0	0	1.00	0.34	0.34	0.34
PAOB BAS	0.1	0.1	0.1	0.1	0	1.00	1.00	1.00	0.34
PAOB CAN	0.2	0.2	0.6	0	0.5	1.00	0.25	0.34	0.26
ZIGR	0.3	1.1	0.7	0.5	0.2	0.11	0.30	0.47	0.63
BRDE	0.1	0	0	0	0	0.34	0.34	0.34	0.34
ANN GRAS	0.7	4.3	1.7	0.1	0	0.00	0.23	0.20	0.13
ERWR	0.2	0	0	0.3	0	0.17	0.17	0.70	0.17
SPWR BAS	0.1	0	0.1	0	0	0.34	1.00	0.34	0.34
SPWR CAN	0.2	0	0.2	0.4	0.1	0.34	1.00	0.51	0.66
MUAR BAS	0	0	0	0	0				
MUAR CAN	0.1	0	0	0.1	0	0.34	0.34	1.00	0.34
ISTE	0.1	0	0	0.1	0	0.34	0.34	1.00	0.34
GUSA	0.1	0.1	0.1	0.4	0.2	1.00	1.00	0.14	0.56
SEMA BAS	0	1	2.7	2	4.1	0.02	0.00	0.00	0.00
SEMA CAN	0.3	6.5	8.7	9.3	14.2	0.00	0.00	0.00	0.00
SPFL CAN	0.1	0	0	0	0.4	0.34	0.34	0.34	0.48
SOEL	0.1	0	0.2	0	0	0.34	0.56	0.34	0.34
BOCU CAN	0.1	0.3	0.9	2.3	1.5	0.41	0.03	0.00	0.02
DICA CAN	0.1	0.3	0.5	0.2	0.2	0.29	0.13	0.56	0.56
DICA BAS			0.2	0.1	0				
ERLE BAS				0.2	0.9				
ERLE CAN				3.8	3.2				
ERIN BAS				0.5	0.4				
ERIN CAN				4.5	2.1				
BOGR BAS				0.1	1.5				
BOGR CAN				2.6	3.8				
ALL BASAL	1.2	2.3	4.9	4.7	8.6	0.16	0.00	0.01	0.00
ALL CANOPY	5.2	15	19.3	31.1	35.5	0.00	0.00	0.00	0.00
WOODY SPP	23	4.8	9.9	11.6	11.9	0.00	0.00	0.00	0.00
ANNUALS	2.7	21.1	2.8	8.6	2.6	0.00	0.93	0.00	0.93

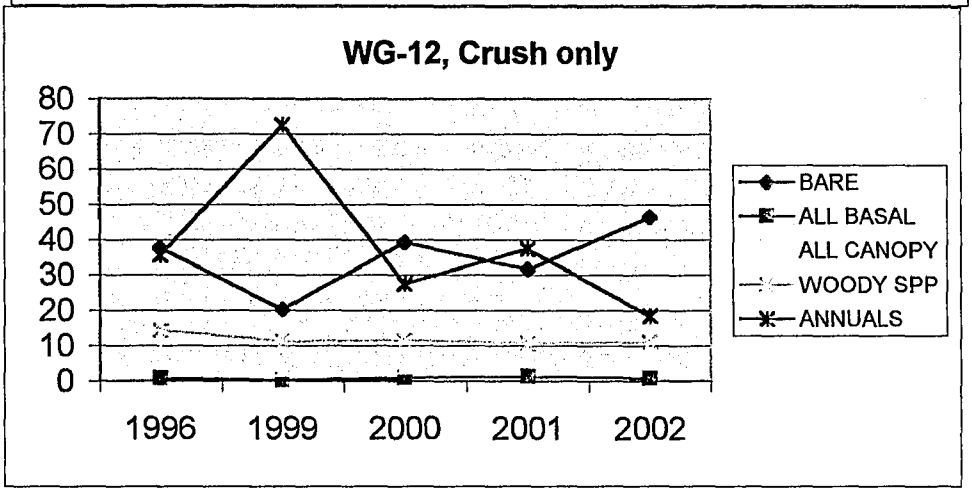
GW-11, Crush only	Means					t-test P			
	1996	1999	2000	2001	2002	96-99	96-00	96-01	96-02
SOIL		53.8	61.7	43.8	43.5				
ROCK		0.5	0.4	0.1	0.9				
BARE	66.1	54.3	62.1	43.9	44.4	0.03	0.42	0.00	0.00
LITTER	9.0	5.2	6.4	7.5	8.7	0.09	0.34	0.47	0.89
PRGL	8.0	2.0	5.0	4.7	5.8	0.00	0.02	0.01	0.07
ANN FORB	2.0	21.3	3.1	14.0	9.6	0.00	0.29	0.00	0.00
ANN GRAS	0.6	2.1	4.1	0.0	0.0	0.12	0.00	0.11	0.11
TAAU	0.5	0.0	0.0	0.4	0.0	0.05	0.05	0.75	0.05
SCBR BAS	1.2	0.2	0.6	1.2	0.7	0.04	0.22	1.00	0.36
SCBR CAN	2.2	1.1	0.9	0.5	1.3	0.23	0.13	0.05	0.32
ARIS BAS	0.5	0.5	1.5	3.3	2.8	1.00	0.11	0.01	0.00
ARIS CAN	2.8	4.7	8.1	18.2	12.7	0.34	0.04	0.00	0.00
BOGR BAS	0.5	0.1	0.1	0.8	0.2	0.13	0.13	0.54	0.27
BOGR CAN	0.7	0.1	0.2	1.4	0.9	0.12	0.19	0.35	0.75
GUSA	0.4	0.5	0.2	0.6	0.5	0.72	0.36	0.48	0.75
PAOB BAS	0.4	0.4	0.5	1.4	2.3	1.00	0.78	0.15	0.07
PAOB CAN	2.7	3.6	4.0	4.4	6.9	0.58	0.40	0.28	0.08
MUAR BAS	0.5	0.0	0.4	0.6	0.3	0.05	0.75	0.81	0.53
MUAR CAN	1.1	0.3	0.7	0.7	1.4	0.15	0.52	0.46	0.70
BOER BAS	0.1	0.2	0.1	0.7	0.2	0.56	1.00	0.17	0.66
BOER CAN	0.5	0.7	0.0	1.1	0.9	0.87	0.18	0.35	0.57
EVOL	0.8	0.0	0.3	0.2	0.0	0.07	0.32	0.17	0.07
CRCO	2.5	1.8	1.4	1.6	3.1	0.35	0.18	0.23	0.48
SEMA BAS	0.0	0.2	0.6	0.2	0.7	0.17	0.08	0.34	0.01
SEMA CAN	0.1	1.0	1.8	1.0	2.6	0.06	0.07	0.06	0.04
ZINNIA	0.2	0.5	0.3	0.2	1.8	0.27	0.70	1.00	0.27
DAPU CAN	0.1	0.0	0.1	0.5	0.6	0.34	1.00	0.19	0.28
SPSP	0.2	0.4	0.0	0.4	0.0	0.36	0.17	0.36	0.17
ASTER	0.1	0.0	0.0	0.0	0.1	0.35	0.35	0.35	0.94
ISTE	0.5	0.5	0.3	0.3	0.1	1.00	0.57	0.60	0.24
DICA CAN	0.1	0.1	0.0	1.1	0.1	1.00	0.34	0.06	1.00
ALL BASAL	3.2	1.6	3.8	8.2	7.2	0.18	0.62	0.02	0.03
ALL CANOPY	10.1	11.4	15.7	27.3	26.7	0.74	0.13	0.00	0.00
WOODY SPP	8.0	2.0	3.5	4.7	5.8	0.00	0.02	0.01	0.07
ANNUALS	2.6	23.4	7.2	14.0	9.6	0.00	0.00	0.00	0.00

GW-12, Crush+seed	Means					t-test P			
	1996	1999	2000	2001	2002	96-99	96-00	96-01	96-02
SOIL		45.8	63.3	37.2	50.7				
ROCK		0.3	1.0	0.6	0.9				
BARE	63.5	46.1	64.3	37.8	51.6	0.00	0.86	0.00	0.01
LITTER	11.7	7.2	11.5	6.9	9.7	0.07	0.93	0.06	0.38
PRGL	5.7	2.9	3.6	3.7	3.1	0.06	0.14	0.12	0.06
ANN FORB	1.0	12.6	0.1	13.4	1.6	0.00	0.00	0.00	0.13
ARIS BAS	1.3	1.2	2.8	4.0	1.8	0.84	0.08	0.00	0.32
ARIS CAN	6.9	10.0	10.1	14.7	8.6	0.18	0.12	0.00	0.26
BOER BAS	0.8	0.2	0.3	0.3	0.7	0.11	0.15	0.15	0.82
BOER CAN	1.6	0.9	1.0	1.8	2.0	0.25	0.37	0.83	0.66
CRCO	3.9	4.2	1.5	3.1	3.5	0.75	0.00	0.27	0.61
MUAR BAS	0.3	0.1	0.1	0.1	0.5	0.41	0.41	0.41	0.53
MUAR CAN	1.0	0.9	0.5	1.2	0.9	0.86	0.34	0.75	0.86
PAOB BAS	0.5	1.7	1.3	2.1	3.7	0.05	0.14	0.00	0.01
PAOB CAN	2.9	9.8	4.9	7.0	10.6	0.00	0.11	0.01	0.00
SCBR BAS	0.9	0.3	0.0	1.0	0.6	0.38	0.19	0.90	0.69
SCBR CAN	1.2	1.2	0.4	0.7	1.2	1.00	0.35	0.54	1.00
ZINNIA	0.4	1.0	0.3	0.4	0.2	0.07	0.71	1.00	0.45
ISTE	0.4	0.1	0.0	0.0	0.1	0.14	0.04	0.04	0.14
TAAU	0.1	0.0	0.0	0.0	0.0	0.34	0.34	0.34	0.34
EVOL	0.7	0.9	0.4	0.3	1.0	0.63	0.34	0.21	0.53
HIMU BAS	0.1	0.2	0.2	0.0	0.0	0.66	0.66	0.34	0.34
HIMU CAN	0.1	0.3	0.2	0.0	0.0	0.54	0.66	0.34	0.34
GUSA	0.2	0.1	0.0	0.4	0.4	0.56	0.17	0.45	0.36
ERLE BAS	0.1	0.0	0.0	0.5	0.0	0.34	0.34	0.13	0.34
ERLE CAN	0.1	0.0	0.0	1.6	0.0	0.34	0.34	0.11	0.34
ERIN BAS				0.3	0.1				
ERIN CAN				2.5	6.3				
BOGR BAS				0.2	0.4				
BOGR CAN				2.3	1.9				
ANN GRASS	0.1	0.6	0.2	0.2	0.0	0.15	0.66	0.66	0.34
SEMA BAS			0.4	0.8	0.5				
SEMA CAN			1.3	3.2	2.4				
PAN SP CAN				0.6	0.1				
BOCU BAS				0.0	0.1				
BOCU CAN				0.8	0.5				
ALL BASAL	4.0	3.7	5.1	9.2	8.4	0.86	0.56	0.01	0.04
ALL CANOPY	13.8	23.1	18.4	35.8	34.4	0.00	0.11	0.00	0.01
WOODY SPP	5.7	2.9	3.6	3.7	3.1	0.06	0.14	0.12	0.06
ANNUALS	1.1	13.2	0.3	13.6	1.6	0.00	0.05	0.00	0.24


WG-2, Crush only
80
70
60
50
40
30
20
10
0
1996
1999
2000
2001
2002
BARE
ALL BASAL
ALL CANOPY
WOODY SPP
ANNUALS


WG-8, Crush only
80
70
60
50
40
30
20
10
0
1996
1999
2000
2001
2002
BARE
ALL BASAL
ALL CANOPY
WOODY SPP
ANNUALS


WG-10, Crush only
80
70
60
50
40
30
20
10
0
1996
1999
2000
2001
2002
BARE
ALL BASAL
ALL CANOPY
WOODY SPP
ANNUALS


WG-12, Crush only
80
70
60
50
40
30
20
10
0
1996
1999
2000
2001
2002
BARE
ALL BASAL
ALL CANOPY
WOODY SPP
ANNUALS

WG-1, Control	Means					t-test P			
	1996	1999	2000	2001	2002	96-99	96-00	96-01	96-02
SOIL		36.5	41.1	45.5	46.3				
ROCK		2.4	8.4	4.7	6.7				
BARE	49.6	38.9	49.5	50.2	53.0	0.01	0.98	0.86	0.33
LITTER	11.6	7.0	17.1	11.3	8.5	0.06	0.08	0.89	0.19
FORB	1.5	12.5	1.7	12.3	6.0	0.00	0.79	0.00	0.00
ANN GRASS	7.5	6.4	8.5	2.4	3.0	0.69	0.79	0.06	0.09
WHITETHORN	10.9	10.4	11.8	11.2	9.6	0.86	0.65	0.92	0.57
PRGL	7.0	11.3	8.0	11.1	7.6	0.17	0.68	0.20	0.83
GUSA	6.2	13.6	0.6	2.3	4.4	0.00	0.00	0.01	0.15
SOEL	0.6	0.6	0.0	0.0	0.0	0.95	0.02	0.02	0.02
ARIS BAS	0.4	0.0	0.2	0.1	0.1	0.17	0.56	0.31	0.31
ARIS CAN	6.0	0.9	0.6	2.2	3.0	0.00	0.00	0.01	0.03
HIMU BAS	0.2	0.0	0.1	0.3	0.8	0.17	0.56	0.63	0.08
HIMU CAN	1.2	0.9	0.8	2.7	2.0	0.70	0.53	0.25	0.44
MUPO BAS	0.1	0.6	0.2	0.5	0.8	0.16	0.56	0.13	0.04
MUPO CAN	1.7	4.0	2.2	2.1	3.1	0.14	0.64	0.69	0.19
SEMA BAS	0.0	0.0	0.0	0.3	0.1			0.19	0.34
SEMA CAN	0.1	1.6	0.3	1.7	0.4	0.06	0.54	0.09	0.24
BORO BAS	0.0	0.0	0.0	0.0	0.1				0.34
BORO CAN	0.0	0.0	0.0	0.0	1.4				0.09
PPEAR	0.1	0	0	0	0	0.34	0.34	0.34	0.34
YUEL	0.2	0.0	0.0	0.0	0.0	0.34	0.34	0.34	0.34
MIBI	0.1	0.0	0.0	0.0	0.0	0.34	0.34	0.34	0.34
TARBUSH		1.4	1.0	0.9	1.1				
HODE				0.8	0.0				
ALL BASAL	0.7	0.5	0.5	1.2	1.9	0.70	0.68	0.34	0.04
ALL CANOPY	9.0	5.9	3.9	8.7	9.9	0.26	0.01	0.89	0.70
WOODY SPP	18.2	18.4	20.8	23.2	18.3	0.96	0.22	0.10	0.97
ANNUALS	9.0	15.1	10.2	14.7	9.0	0.13	0.76	0.13	1.00

WG-2, Crush only	Means					t-test P			
	1996	1999	2000	2001	2002	96-99	96-00	96-01	96-02
SOIL		70.2	69.5	55.9	54.8				
ROCK		5.5	4.3	4.3	5.2				
BARE	75.8	75.7	73.8	60.0	60.0	0.97	0.51	0.00	0.00
LITTER	4.0	8.2	11.7	11.9	7.8	0.02	0.00	0.00	0.04
FORB	0.0	7.3	4.7	13.6	22.2	0.00	0.00	0.00	0.00
ANN GRASS	0.0	1.5	1.7	0.7	0.0	0.11	0.01	0.02	
PRGL	13.0	4.9	6.9	9.1	9.0	0.00	0.00	0.05	0.06
GUSA	0.0	0.1	0.2	1.1	0.4	0.34	0.34	0.15	0.22
TARBUSH	6.5	1.2	1.8	2.5	1.8	0.00	0.00	0.00	0.00
4WING	0.3	0.0	0.0	0.1	0.3	0.08	0.08	0.29	1.00
MUPO BAS	0.0	0.0	0.0	0.0	0.1				0.34
MUPO CAN	0.0	0.0	0.1	0.0	0.2		0.34		0.17
ACOU	0.2	0.1	0.1	0.2	0.0	0.56	0.56	1.00	0.17
SEMA BAS		0.0	0.1	0.3	0.2				
SEMA CAN		0.8	0.6	1.9	0.4				
HODE				0.3	0.0				
SOEL				0.4	0.0				
ALL BASAL	0.0	0.0	0.1	0.3	0.3		0.34	0.19	0.19
ALL CANOPY	0.0	0.8	0.7	1.9	0.6	0.05	0.01	0.01	0.08
WOODY SPP	19.8	6.1	8.7	11.7	11.1	0.00	0.00	0.00	0.00
ANNUALS	0.0	8.8	6.4	14.3	22.2	0.00	0.00	0.00	0.00

WG-3, Crush+seed	Means					t-test P			
	1996	1999	2000	2001	2002	96-99	96-00	96-01	96-02
SOIL		51.5	53.8	43.1	46.9				
ROCK		8.2	8.7	5.7	6.3				
BARE	66.3	59.7	62.5	48.8	53.2	0.01	0.20	0.00	0.00
LITTER	4.7	8.5	11.5	9.1	9.8	0.00	0.00	0.00	0.00
FORB	0.0	7.4	1.8	2.9	5.8	0.00	0.00	0.02	0.00
ANN GRASS	0.0	1.2	1.0	0.3	0.2	0.01	0.01	0.08	0.17
PRGL	17.8	4.2	7.1	10.4	10.9	0.00	0.00	0.00	0.01
TARBUSH	12.2	2.8	2.6	3.1	2.9	0.00	0.00	0.00	0.00
SEMA BAS	0.0	2.0	2.5	6.8	4.7	0.00	0.00	0.00	0.00
SEMA CAN	0.1	16.7	14.9	27.7	15.7	0.00	0.00	0.00	0.00
GUSA	0.3	0.2	0.0	0.0	0.0	0.74	0.19	0.19	0.19
HIMU CAN			1.0	1.4	2.4				
BOCU BAS				0.1	0.0				
BOCU CAN				0.7	0.4				
BOGR BAS				0.1	0.1				
BOGR CAN				0.2	1.3				
ALL BASAL	0.0	2.0	2.5	7.0	4.8	0.00	0.00	0.00	0.00
ALL CANOPY	0.1	16.7	14.9	28.6	17.4	0.00	0.00	0.00	0.00
WOODY SPP	30.0	7.0	9.7	13.5	13.8	0.00	0.00	0.00	0.00
ANNUALS	0.0	8.6	2.8	3.2	6.0	0.00	0.00	0.02	0.00

WG-4, Control	Means					t-test P			
	1996	1999	2000	2001	2002	96-99	96-00	96-01	96-02
SOIL		49.6	42.4	39.8	42.8				
ROCK		10.4	9.9	7.0	11.8				
BARE	59.6	60.0	52.3	46.8	54.6	0.91	0.11	0.00	0.13
LITTER	6.9	5.6	6.8	6.1	5.3	0.31	0.95	0.53	0.20
FORB	0.6	2.4	0.9	2.8	0.4	0.25	0.58	0.06	0.65
ANN GRASS	0.0	0.1	0.5	0.0	0.1	0.35	0.10		0.34
WHITETHORN	0.3	1.3	2.6	2.5	0.8	0.43	0.04	0.03	0.30
PRGL	19.8	14.3	23.7	29.3	22.5	0.01	0.04	0.00	0.25
TARBUSH	13.0	14.6	12.9	13.3	15.6	0.41	0.96	0.88	0.28
GUSA	1.4	2.5	0.1	0.9	1.1	0.29	0.05	0.43	0.67
MUPO BAS	0.3	0.3	0.1	0.7	0.1	0.85	0.41	0.47	0.41
MUPO CAN	1.4	1.5	2.0	3.1	1.4	0.89	0.46	0.12	1.00
HIMU BAS	0.0	0.0	0.0	0.0	0.0				
HIMU CAN	0.1	0.0	0.2	0.4	0.1	0.34	0.66	0.31	1.00
ARIS BAS	0.0	0.0	0.0	0.2	0.1			0.34	0.34
ARIS CAN	0.6	1.0	0.3	0.6	0.4	0.68	0.56	1.00	0.70
BOER BAS	0.0	0.0	0.0	0.0	0.1				0.34
BOER CAN	0.2	0.0	0.0	0.1	0.4	0.17	0.17	0.56	0.56
DICA BAS	0.0	0.0	0.0	0.0	0.0				
DICA CAN	0.2	0.0	0.0	0.1	0.0	0.34	0.34	0.66	0.34
LARREA	0.1	0.0	0.2	0.2	0.0	0.34	0.66	0.66	0.34
SEMA BAS	0.0	0.1	0.2	0.0	0.0	0.35	0.17		
SEMA CAN	0.1	1.1	0.9	0.8	0.0	0.16	0.07	0.13	0.34
SALTBUSH				0.6	0.7				
ALL BASAL	0.3	0.3	0.3	0.9	0.3	1.00	1.00	0.33	1.00
ALL CANOPY	2.6	2.9	3.4	5.1	2.3	0.85	0.55	0.20	0.84
WOODY SPP	33.2	24.1	39.4	45.3	38.9	0.08	0.08	0.01	0.15
ANNUALS	0.6	2.0	1.4	2.8	0.5	0.28	0.25	0.06	0.82

WG-5, Crush+seed	Means					t-test P			
	1996	1999	2000	2001	2002	96-99	96-00	96-01	96-02
SOIL		31.2	38.9	39.2	47.7				
ROCK		4.2	7.5	5.7	9.7				
BARE	46.3	35.4	46.4	45.0	57.4	0.02	0.98	0.78	0.02
LITTER	9.7	5.5	22.1	15.9	10.7	0.01	0.00	0.00	0.53
FORB	2.2	18.3	0.8	11.8	2.0	0.00	0.10	0.00	0.81
ANN GRASS	14.7	22.1	16.6	2.1	8.5	0.05	0.51	0.00	0.04
WHITETHORN	11.6	5.8	6.3	7.1	4.9	0.00	0.00	0.04	0.00
PRGL	2.5	0.3	0.9	1.1	0.9	0.00	0.03	0.06	0.02
TARBUSH	1.4	0.5	0.4	0.0	0.4	0.26	0.20	0.08	0.20
GUSA	3.8	7.2	0.6	1.5	3.6	0.00	0.00	0.02	0.83
MUPO BAS	0.0	0.0	0.2	0.2	0.1		0.34	0.17	0.34
MUPO CAN	1.1	0.5	1.3	0.8	0.2	0.33	0.82	0.62	0.13
HIMU BAS	1.4	1.7	2.1	1.1	1.6	0.85	0.64	0.67	0.84
HIMU CAN	7.3	1.0	4.9	5.5	4.3	0.05	0.53	0.64	0.40
ARIS BAS	0.0	0.0	0.0	0.1	0.5			0.34	0.14
ARIS CAN	4.9	1.0	0.2	2.2	3.0	0.01	0.00	0.05	0.19
PAOB BAS	0.0	0.0	0.0	0.0	0.0				
PAOB CAN	0.3	0.1	0.0	0.2	0.0	0.41	0.19	0.70	0.19
YUEL	0.4	0.0	0.1	0.1	0.3	0.10	0.24	0.24	0.71
HODE	0.3	0.5	0.0	0.9	0.0	0.57	0.19	0.10	0.19
ISTE	0.1	0.2	0.0	0.0	0.0	0.66	0.34	0.34	0.34
SEMA BAS		0.4	0.3	1.0	1.1				
SEMA CAN		6.8	2.7	6.9	4.5				
BORO BAS				0.0	0.2				
BORO CAN				2.5	0.8				
ALL BASAL	1.4	2.1	2.6	2.4	3.5	0.65	0.44	0.17	0.02
ALL CANOPY	13.6	9.4	9.1	18.1	12.8	0.20	0.22	0.26	0.81
WOODY SPP	15.9	6.6	7.7	8.3	6.5	0.00	0.00	0.00	0.00
ANNUALS	16.9	40.4	17.4	13.9	10.5	0.00	0.89	0.38	0.07

WG-6, Control	Means					t-test P			
	1996	1999	2000	2001	2002	96-99	96-00	96-01	96-02
SOIL		50.4	53.8	53.6	53.6				
ROCK		7.6	8.4	5.5	6.2				
BARE	58.0	58.0	62.1	59.0	65.9	1.00	0.59	0.79	0.03
LITTER	7.2	5.3	6.1	6.0	5.8	0.06	0.67	0.28	0.33
ANN GRASS	0.1	3.8	10.3	0.0	0.3	0.10	0.31	0.34	0.41
WHITETHORN	3.3	3.0	2.6	3.3	1.8	0.81	0.95	1.00	0.20
PRGL	13.7	11.6	15.1	18.2	12.8	0.40	0.49	0.20	0.72
TARBUSH	9.9	11.1	12.3	11.5	10.3	0.51	0.62	0.53	0.77
GUSA	5.0	2.3	0.1	0.5	0.5	0.01	0.00	0.00	0.00
MUPO BAS	0.3	0.8	1.0	0.1	0.7	0.15	0.15	0.29	0.15
MUPO CAN	6.2	6.8	4.8	3.2	4.0	0.66	0.38	0.01	0.11
HIMU BAS	0.2	0.3	0.0	0.4	0.6	0.88	0.34	0.59	0.54
HIMU CAN	0.4	1.9	0.0	1.1	1.0	0.29	0.66	0.46	0.59
ARIS BAS	0.0	0.0	0.0	0.0	0.1				0.34
ARIS CAN	0.7	0.4	0.0	0.3	0.2	0.58	0.21	0.49	0.39
SEMA BAS	0.0	0.1	0.0	0.0	0.1	0.35	0.34		0.34
SEMA CAN	0.5	1.0	0.3	0.4	0.1	0.23	0.47	0.75	0.13
4WING	0.7	0.3	0.1	0.6	0.4	0.34	0.20	0.86	0.57
SPWR BAS	0.0	0.0	0.0	0.0	0.0				
SPWR CAN	0.2	0.0	0.0	0.0	0.0	0.34	0.34	0.34	0.34
PAOB BAS	0.0	0.0	0.0	0.0	0.0				
PAOB CAN	0.3	0.8	0.1	0.0	0.0	0.42	0.41	0.19	0.19
ACOUTRIA	0.1	0.5	0.3	0.0	0.0	0.09	0.56	0.34	0.34
ANN FORB		2.1	0.1	2.4	0.0				
ALL BASAL	0.5	0.9	0.9	0.5	1.5	0.35	0.35	1.00	0.24
ALL CANOPY	8.3	8.6	5.6	5.0	5.3	0.91	0.24	0.15	0.27
WOODY SPP	27.6	20.8	29.8	33.6	25.3	0.11	0.58	0.13	0.40
ANNUALS	0.1	4.7	8.9	2.4	0.3	0.04	0.29	0.03	0.41

WG-7, Crush+seed	Means					t-test P			
	1996	1999	2000	2001	2002	96-99	96-00	96-01	96-02
SOIL		35.2	46.2	38.9	44.7				
ROCK		7.9	10.0	8.3	11.0				
BARE	54.5	43.1	56.2	47.2	55.7	0.05	0.73	0.16	0.82
LITTER	7.1	9.2	14.3	10.8	13.3	0.22	0.00	0.07	0.02
ANN FORB	1.2	25.6	4.1	14.8	3.9	0.00	0.04	0.00	0.00
ANN GRASS	0.9	8.3	2.9	0.4	0.6	0.00	0.12	0.24	0.67
WHITETHORN	9.1	5.5	6.1	7.0	0.0	0.01	0.02	0.10	0.00
PRGL	13.1	5.4	6.5	9.5	9.4	0.00	0.00	0.07	0.02
TARBUSH	5.6	1.2	2.4	0.9	1.4	0.00	0.03	0.00	0.00
GUSA	4.2	1.6	0.3	1.3	1.9	0.04	0.00	0.02	0.08
MUPO BAS	0.7	0.3	0.1	0.2	0.6	0.21	0.05	0.11	0.77
MUPO CAN	7.1	1.7	1.0	1.7	1.6	0.00	0.00	0.00	0.00
HIMU BAS	0.4	0.2	0.6	0.5	0.6	0.51	0.67	0.79	0.68
HIMU CAN	3.5	1.2	1.8	2.4	1.8	0.35	0.50	0.67	0.50
ARIS BAS	0.0	0.0	0.0	0.1	0.0			0.34	
ARIS CAN	0.1	0.3	0.3	0.2	0.0	0.54	0.29	0.66	0.34
SEMA BAS	0.0	0.8	1.6	1.8	2.1	0.00	0.02	0.00	0.00
SEMA CAN	0.5	6.7	7.2	13.0	7.3	0.00	0.00	0.00	0.00
4WING	0.1	0.0	0.1	0.0	0.2	0.34	1.00	0.34	0.56
PAOB BAS	0.1	0.0	0.0	0.1	0.1	0.34	0.34	1.00	1.00
PAOB CAN	0.2	0.3	0.0	1.4	0.4	0.74	0.34	0.24	0.51
DICA BAS	0.0	0.0	0.0	0.0	0.1				0.34
DICA CAN	0.5	0.0	0.0	0.1	0.1	0.05	0.05	0.13	0.13
OPSPI	0.1	0.0	0.0	0.0	0.0	0.34	0.34	0.34	0.34
SOEL	0.1	0.3	0.0	0.1	0.0	0.29	0.34	1.00	0.34
BOER BAS				0.0	0.0				
BOER CAN				0.1	0.0				
BOCU BAS				0.0	0.0				
BOCU CAN				0.4	0.1				
ALL BASAL	1.2	1.3	2.3	2.7	3.5	0.86	0.18	0.03	0.02
ALL CANOPY	11.9	10.2	10.3	19.3	11.3	0.69	0.68	0.09	0.88
WOODY SPP	28.0	12.1	15.1	17.4	11.0	0.00	0.00	0.00	0.00
ANNUALS	2.1	33.9	7.0	15.2	4.5	0.00	0.03	0.00	0.08

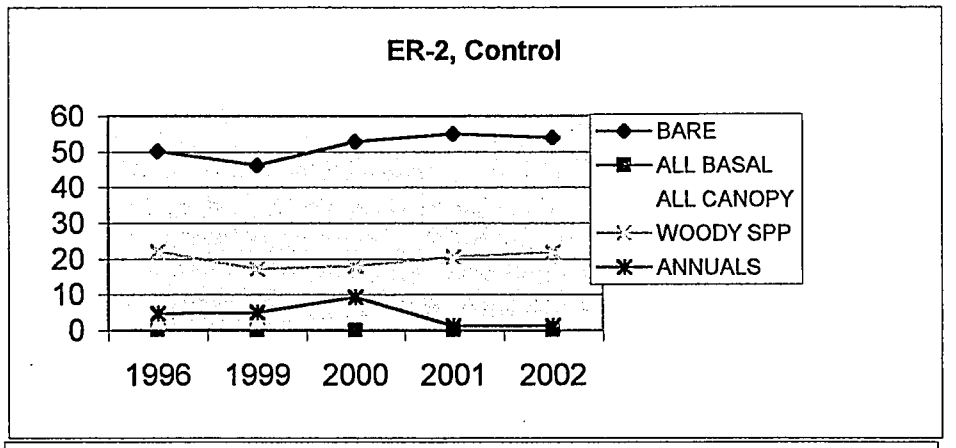
WG-8, Crush only	Means					t-test P			
	1996	1999	2000	2001	2002	96-99	96-00	96-01	96-02
SOIL		26.6	34.4	27.2	40.6				
ROCK		9.2	12.2	11.0	14.7				
BARE	47.0	35.8	46.6	38.2	55.3	0.03	0.93	0.06	0.07
LITTER	8.4	5.5	15.4	14.3	11.6	0.06	0.00	0.01	0.01
ANN FORB	6.7	26.4	8.3	22.3	4.4	0.00	0.57	0.00	0.31
PRGL	8.1	5.1	6.2	4.4	5.6	0.12	0.38	0.07	0.22
ANN GRAS	5.6	6.6	7.5	2.2	2.2	0.64	0.41	0.07	0.08
TARBUSH	0.2	0.3	0.1	0.2	0.2	0.74	0.66	1.00	1.00
GUSA	3.5	11.4	0.6	3.0	3.1	0.00	0.00	0.59	0.62
MUPO BAS	0.2	0.1	0.1	0.0	0.0	0.56	0.56	0.17	0.17
MUPO CAN	5.1	2.3	0.7	0.2	1.5	0.11	0.01	0.01	0.03
WHITETHORN	14.0	11.2	11.8	11.3	10.5	0.20	0.30	0.16	0.06
DICA BAS	0.4	0.0	0.0	0.0	0.1	0.04	0.04	0.04	0.14
DICA CAN	0.7	0.1	0.0	0.5	0.0	0.12	0.07	0.63	0.07
ARIS BAS	0.1	0.1	0.0	0.6	2.2	1.00	0.34	0.19	0.01
ARIS CAN	2.1	2.6	1.8	4.8	4.1	0.54	0.64	0.08	0.16
SEMA BAS	0.1	0.0	0.0	0.1	0.1	0.34	0.34	1.00	1.00
SEMA CAN	0.3	0.3	0.4	0.5	0.4	1.00	0.77	0.57	0.71
SOEL	0.1	0.4	0.1	0.1	0.0	0.24	1.00	1.00	0.34
HIMU BAS	0.3	0.4	0.3	0.7	0.4	0.75	1.00	0.49	0.79
HIMU CAN	2.5	3.1	1.4	2.2	1.9	0.64	0.25	0.82	0.61
CRCO	0.7	0.9	0.0	0.5	0.4	0.71	0.11	0.67	0.56
PAOB BAS	0.0	0.0	0.3	0.1	0.0		0.19	0.34	
PAOB CAN	0.5	0.4	0.3	0.6	0.3	0.79	0.53	0.83	0.60
BOCH BAS	0.2	0.0	0.3	0.0	0.3	0.34	0.70	0.34	0.74
BOCH BAS	0.8	1.7	0.8	0.0	1.4	0.39	1.00	0.14	0.53
OPSPI	0.2	0.0	0.0	0.0	0.0	0.17	0.17	0.17	0.17
BOER BAS	0.0	0.0	0.0	0.0	0.0				
BOER CAN	0.2	0.0	0.0	0.1	0.4	0.34	0.34	0.66	0.51
BORO BAS			0.7	0.8	0.0				
BORO CAN			0.9	4.1	0.2				
BOGR CAN			0.2	0.2	0.0				
BOCU CAN				0.1	0.0				
ALL BASAL	1.3	0.6	1.7	2.3	3.1	0.12	0.64	0.16	0.05
ALL CANOPY	12.2	10.5	6.3	13.0	10.2	0.46	0.02	0.79	0.42
WOODY SPP	22.5	16.6	18.1	15.9	16.3	0.10	0.25	0.05	0.07
ANNUALS	12.3	33.0	15.8	24.5	6.6	0.00	0.46	0.01	0.15

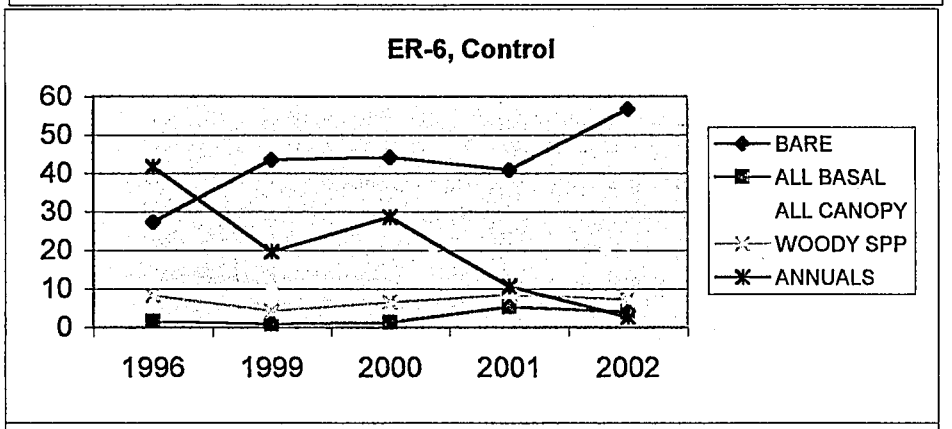
WG-9, Crush+seed	Means					t-test P			
	1996	1999	2000	2001	2002	96-99	96-00	96-01	96-02
SOIL		42.1	51.5	53.8	62.7				
ROCK		6.3	8.1	7.2	8.2				
BARE	61.3	48.4	59.6	61.0	70.9	0.01	0.79	0.95	0.04
LITTER	9.6	6.0	16.8	11.6	8.1	0.07	0.00	0.36	0.45
FORB	1.8	17.8	0.5	7.1	2.2	0.00	0.03	0.00	0.59
PRGL	0.2	0.1	0.2	0.2	0.0	0.56	1.00	1.00	0.17
ANN GRAS	7.9	14.4	17.9	2.2	3.5	0.03	0.06	0.03	0.08
WHITETH	11.0	4.7	3.1	5.1	3.8	0.01	0.00	0.01	0.00
HIMU BAS	0.0	0.0	0.0	0.0	0.2				0.34
HIMU CAN	0.8	0.2	0.0	0.3	0.6	0.33	0.18	0.40	0.81
GUSA	3.3	5.9	0.4	4.2	3.8	0.04	0.00	0.48	0.61
ARIS BAS	0.1	0.0	0.0	0.0	0.1	0.34	0.34	0.34	1.00
ARIS CAN	0.3	0.3	0.0	0.9	1.5	1.00	0.19	0.16	0.05
DAPU BAS	0.3	0.0	0.0	0.0	0.0	0.19	0.19	0.19	0.19
DAPU CAN	0.8	0.0	0.0	0.1	0.3	0.04	0.04	0.07	0.19
ZINNIA	0.9	0.0	0.0	0.1	0.3	0.01	0.01	0.02	0.10
TARBUSH	1.9	0.0	0.0	0.2	0.4	0.02	0.02	0.03	0.06
LARREA	0.5	0.0	0.0	0.1	0.0	0.14	0.14	0.24	0.14
HODE	0.1	0.7	0.0	0.5	0.0	0.05	0.34	0.13	0.34
SEMA BAS			0.2	0.9	1.2				
SEMA CAN			1.9	6.3	5.5				
MUPO BAS				0.2	0.0				
MUPO CAN				0.6	0.2				
ALL BASAL	0.4	0.0	0.2	1.1	1.5	0.10	0.45	0.24	0.01
ALL CANOPY	1.9	0.5	1.9	8.2	8.1	0.05	1.00	0.03	0.00
WOODY SPP	13.6	4.8	3.3	5.6	4.2	0.00	0.00	0.00	0.00
ANNUALS	9.7	32.2	18.4	9.3	5.7	0.00	0.09	0.89	0.12

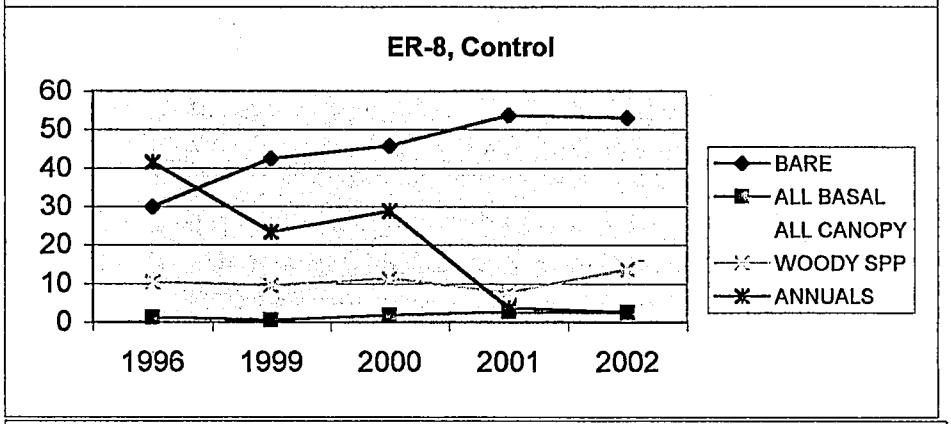
WG-10, Crush only	Means					t-test P			
	1996	1999	2000	2001	2002	96-99	96-00	96-01	96-02
SOIL		39.0	45.2	46.9	61.2				
ROCK		2.0	2.8	2.3	3.3				
BARE	53.9	41.0	47.7	49.2	64.5	0.03	0.27	0.37	0.04
LITTER	9.1	6.8	14.3	10.0	10.8	0.07	0.04	0.58	0.30
FORB	2.1	17.9	1.1	22.4	5.1	0.00	0.29	0.00	0.03
PRGL	1.4	0.7	1.2	1.7	1.3	0.23	0.72	0.68	0.89
ANN GRAS	11.2	25.4	27.7	0.5	4.8	0.02	0.00	0.00	0.03
WHITETH	12.3	5.6	6.3	6.2	6.6	0.02	0.03	0.03	0.03
HIMU BAS	0.1	0.1	0.4	0.6	0.4	1.00	0.37	0.15	0.37
HIMU CAN	0.9	0.2	1.8	1.9	2.1	0.13	0.37	0.39	0.34
GUSA	4.1	4.0	0.5	2.1	0.8	0.95	0.00	0.10	0.01
MUPO BAS	0.0	0.0	0.0	0.2	0.0			0.17	
MUPO CAN	0.2	0.7	0.4	0.6	0.9	0.23	0.45	0.39	0.11
ARIS BAS	0.3	0.1	0.0	0.3	0.2	0.29	0.08	1.00	0.63
ARIS CAN	3.8	2.9	2.4	5.5	3.7	0.52	0.22	0.36	0.94
MIBI	0.1	0.0	0.0	0.0	0.0	0.34	0.34	0.34	0.34
PAOB BAS	0.0	0.1	0.0	0.3	0.1	0.34		0.19	0.34
PAOB CAN	0.4	0.5	0.2	0.9	0.4	0.85	0.66	0.50	1.00
TARBUSH	0.4	0.1	0.1	0.0	0.2	0.24	0.24	0.10	0.45
SEMA BAS	0.0	0.0	0.1	0.0	0.0		0.34		
SEMA CAN	0.2	0.2	0.2	0.9	0.2	1.00	1.00	0.11	1.00
ERLE BAS	0.0	0.0	0.0	0.0	0.0				
ERLE CAN	0.1	0.0	0.0	0.1	0.0	0.34	0.34	1.00	0.34
HODE				0.2	0.0				
BORO BAS				0.0	0.0				
BORO CAN				0.9	0.3				
ALL BASAL	0.4	0.3	0.5	1.4	0.7	0.75	0.79	0.07	0.59
ALL CANOPY	5.6	4.5	5.0	10.8	7.6	0.54	0.70	0.05	0.35
WOODY SPP	14.2	6.4	7.6	7.9	8.1	0.01	0.02	0.03	0.03
ANNUALS	13.3	43.3	28.8	22.9	9.9	0.00	0.01	0.01	0.32

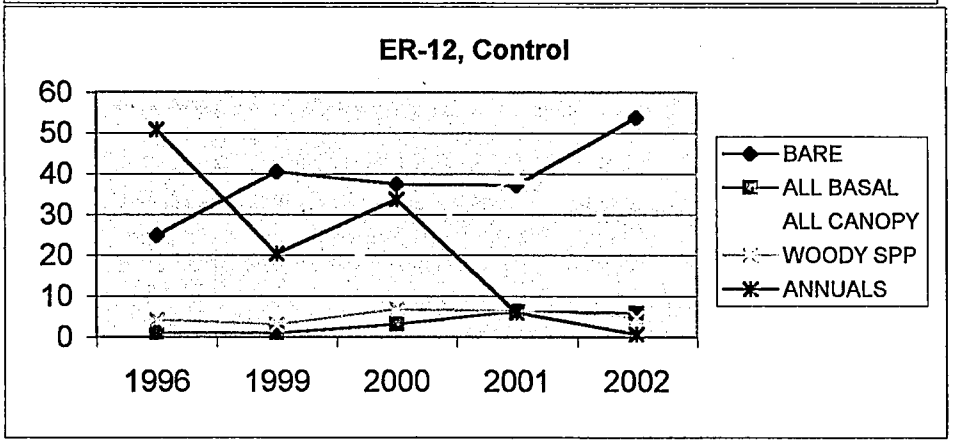
WG-11, Control	Means					t-test P			
	1996	1999	2000	2001	2002	96-99	96-00	96-01	96-02
SOIL		28.8	35.5	31.0	43.4				
ROCK		5.0	6.4	5.4	7.2				
BARE	39.0	33.8	41.9	36.4	50.6	0.34	0.67	0.64	0.07
LITTER	9.0	3.9	13.1	13.9	11.5	0.01	0.08	0.02	0.31
FORB	6.2	22.8	5.8	20.7	2.8	0.00	0.83	0.00	0.02
PRGL	7.5	7.1	7.1	5.4	7.3	0.83	0.83	0.26	0.90
ANN GRASS	10.4	14.5	12.5	0.7	4.2	0.41	0.68	0.01	0.08
WHITETHORN	14.1	18.4	17.9	18.9	15.4	0.14	0.21	0.04	0.57
GUSA	1.9	6.5	0.0	0.9	1.0	0.05	0.01	0.18	0.20
ARIS BAS	0.0	0.1	0.0	0.0	0.1	0.35			0.34
ARIS CAN	2.8	0.3	0.4	0.5	1.2	0.06	0.07	0.09	0.28
MUPO BAS	0.5	0.5	0.0	0.0	0.2	1.00	0.05	0.05	0.33
MUPO CAN	4.2	3.4	0.6	0.6	1.6	0.50	0.00	0.00	0.02
HIMU BAS	1.7	0.9	1.6	2.3	1.5	0.31	0.92	0.62	0.81
HIMU CAN	10.5	6.0	6.0	9.7	5.1	0.19	0.25	0.83	0.12
SEMA BAS	0.0	0.0	0.0	0.0	0.0				
SEMA CAN	0.6	0.0	0.1	0.2	0.4	0.05	0.11	0.25	1.00
PAOB BAS	0.8	0.5	0.0	1.4	1.3	0.64	0.15	0.53	0.55
PAOB CAN	3.3	1.1	0.3	3.2	0.0	0.10	0.02	0.96	0.14
BOCU BAS	0.0	0.0	0.0	0.0	0.0				
BOCU CAN	0.1	0.0	0.0	0.1	0.1	0.34	0.34	1.00	1.00
DICA BAS	0.0	0.0	0.0	0.0	0.0				
DICA CAN	1.6	0.0	0.1	0.0	0.0	0.00	0.01	0.00	0.00
LARREA	0.1	0.0	0.0	0.0	0.0	0.34	0.34	0.34	0.34
P PEAR	0.1	0.0	0.0	0.1	0.1	0.34	0.34	1.00	1.00
TARBUSH	0.2	1.0	1.6	0.8	1.5	0.06	0.01	0.11	0.03
SOEL			0.0	0.1	0.0				
ALL BASAL	3.0	1.6	1.6	3.7	2.2	0.18	0.25	0.69	0.50
ALL CANOPY	23.1	8.6	7.5	14.3	9.9	0.00	0.00	0.06	0.00
WOODY SPP	21.9	21.2	26.6	25.1	24.2	0.88	0.24	0.30	0.45
ANNUALS	16.6	29.8	18.3	21.4	7.0	0.08	0.78	0.32	0.04

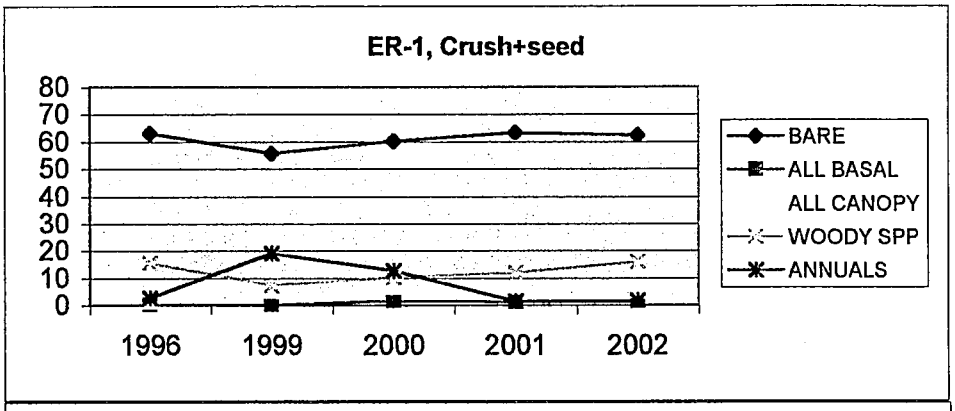
WG-12, Crush only	Means					t-test P			
	1996	1999	2000	2001	2002	96-99	96-00	96-01	96-02
SOIL		17.1	33.9	27.7	41.1				
ROCK		3.1	5.3	3.9	5.2				
BARE	37.5	20.2	39.2	31.6	46.3	0.00	0.65	0.11	0.05
LITTER	8.6	3.5	19.3	12.9	14.7	0.01	0.00	0.05	0.01
ANN FORB	8.9	47.0	10.6	28.8	8.8	0.00	0.41	0.00	0.96
PRGL	4.2	3.1	3.2	3.4	3.6	0.33	0.26	0.44	0.60
ANN GRASS	26.6	25.6	16.9	8.6	9.6	0.83	0.01	0.00	0.00
WHITETHORN	10.0	8.0	8.2	7.2	7.3	0.24	0.18	0.06	0.05
GUSA	2.3	3.9	0.5	1.6	0.9	0.15	0.02	0.40	0.06
MUPO BAS	0.1	0.0	0.0	0.0	0.0	0.34	0.34	0.34	0.34
MUPO CAN	2.3	0.7	0.4	0.2	0.6	0.03	0.01	0.00	0.02
DICA BAS	0.0	0.0	0.0	0.0	0.0				
DICA CAN	0.9	0.0	0.0	0.1	0.0	0.03	0.03	0.05	0.03
HIMU BAS	0.4	0.1	0.6	0.1	0.4	0.31	0.70	0.31	1.00
HIMU CAN	2.0	0.8	1.8	1.0	2.1	0.21	0.87	0.27	0.92
ARIS BAS	0.1	0.1	0.1	0.1	0.2	1.00	1.00	1.00	0.56
ARIS CAN	2.0	1.6	1.1	0.9	1.7	0.58	0.22	0.10	0.61
PAOB BAS	0.1	0.1	0.1	0.5	0.4	1.00	1.00	0.19	0.14
PAOB CAN	1.4	1.8	1.2	3.7	3.0	0.45	0.73	0.02	0.05
SEMA BAS	0.0	0.0	0.0	0.0	0.0				
SEMA CAN	0.4	0.0	0.1	0.1	0.0	0.04	0.14	0.14	0.04
BOFI BAS	0.0	0.0	0.2	0.4	0.0		0.17	0.22	
BOFI CAN	0.4	0.1	0.6	1.2	0.0	0.48	0.71	0.39	0.34
BOBA BAS	0.0	0.0	0.0	0.0	0.0				
BOBA CAN	0.1	0.0	0.0	0.0	0.0	0.34	0.34	0.34	0.34
HODE	0.1	0.0	0.0	0.3	0.0	0.34	0.34	0.29	0.34
SOEL	0.1	0.3	0.0	0.0	0.0	0.29	0.34	0.34	0.34
SPWR BAS	0.1	0.0	0.0	0.0	0.0	0.34	0.34	0.34	0.34
SPWR CAN				0.0	0.0				
BORO BAS				0.2	0.1				
BORO CAN				2.4	0.6				
BOGR BAS				0.3	0.0				
BOGR CAN				3.2	0.1				
BOER BAS				0.0	0.0				
BOER CAN				0.2	0.3				
BOCU BAS				0.2	0.0				
BOCU CAN				0.3	0.0				
ALL BASAL	0.7	0.2	0.9	1.3	0.7	0.19	0.71	0.30	1.00
ALL CANOPY	8.1	3.2	4.0	9.6	5.4	0.00	0.01	0.43	0.05
WOODY SPP	14.2	11.1	11.4	10.6	10.9	0.16	0.04	0.01	0.05
ANNUALS	35.5	72.6	27.5	37.4	18.4	0.00	0.04	0.63	0.00

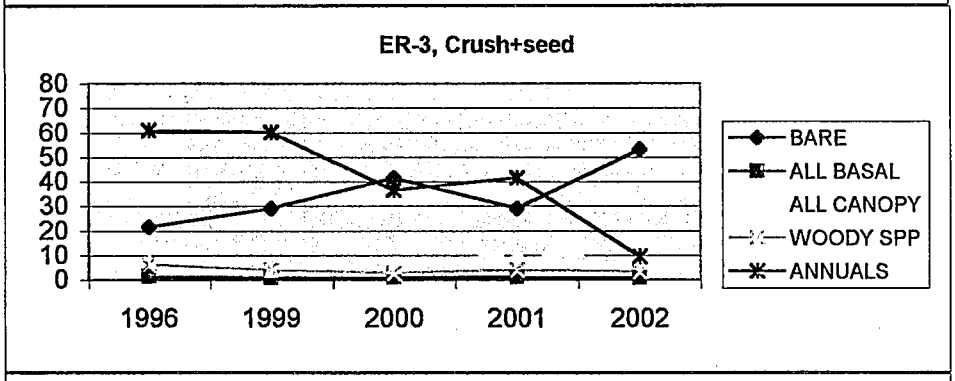

ER-2, Control
60
50
40
30
20
10
0
1996
1999
2000
2001
2002
BARE
ALL BASAL
ALL CANOPY
WOODY SPP
ANNUALS

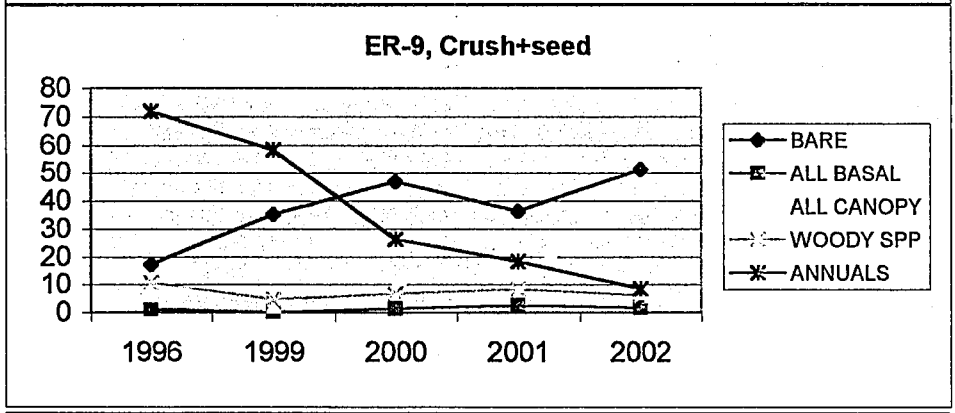

ER-6, Control
60
50
40
30
20
10
0
1996
1999
2000
2001
2002
BARE
ALL BASAL
ALL CANOPY
WOODY SPP
ANNUALS

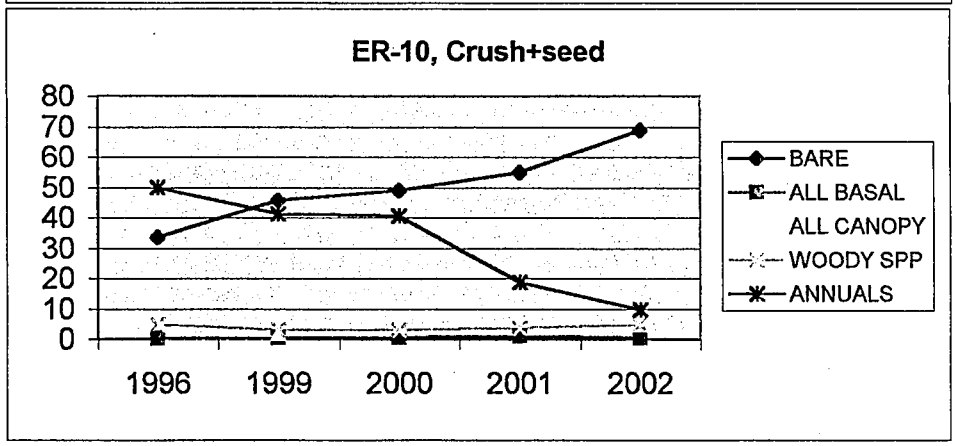

ER-8, Control
60
50
40
30
20
10
0
1996
1999
2000
2001
2002
BARE
ALL BASAL
ALL CANOPY
WOODY SPP
ANNUALS

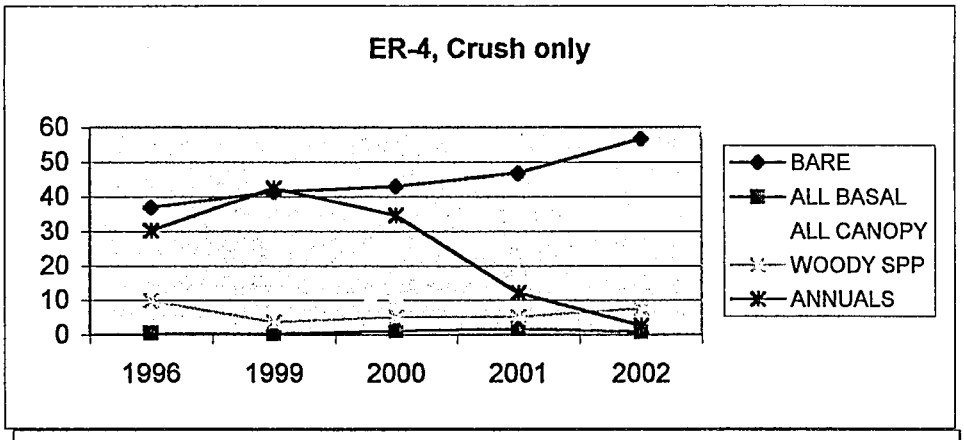

ER-12, Control
60
50
40
30
20
10
0
1996
1999
2000
2001
2002
BARE
ALL BASAL
ALL CANOPY
WOODY SPP
ANNUALS

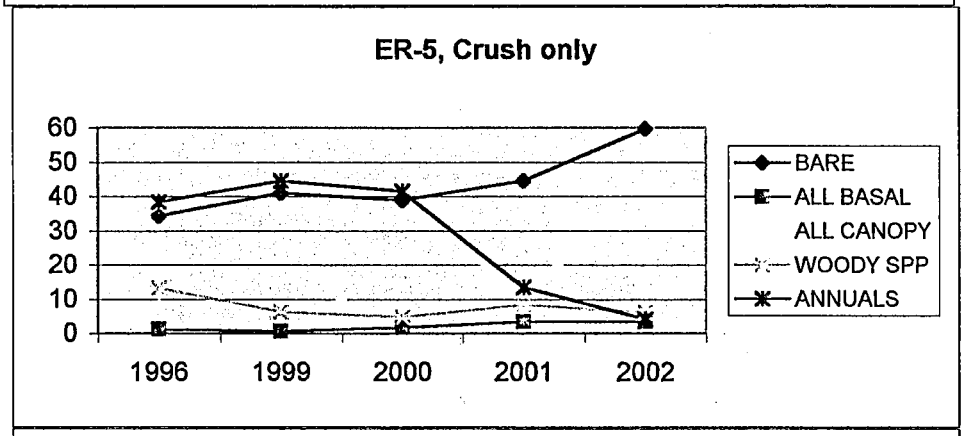

ER-1, Crush+seed
80
70
60
50
40
30
20
10
0
1996
1999
2000
2001
2002
BARE
ALL BASAL
ALL CANOPY
WOODY SPP
ANNUALS

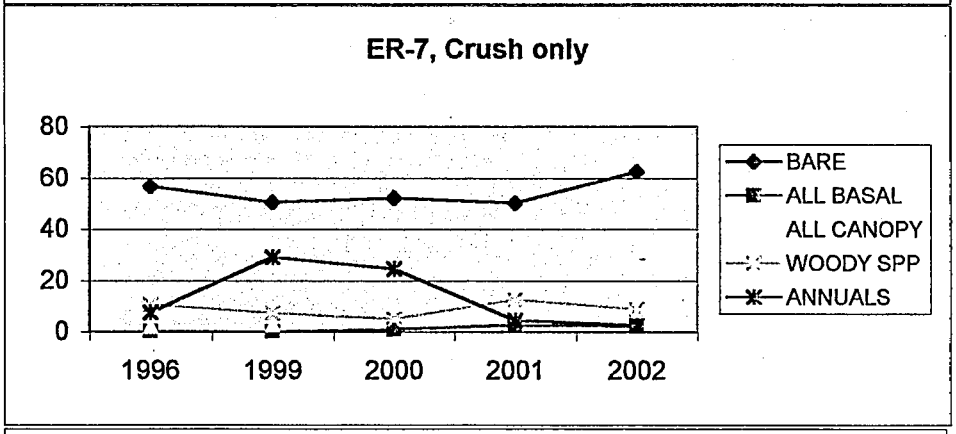

ER-3, Crush+seed
80
70
60
50
40
30
20
10
0
1996
1999
2000
2001
2002
BARE
ALL BASAL
ALL CANOPY
WOODY SPP
ANNUALS

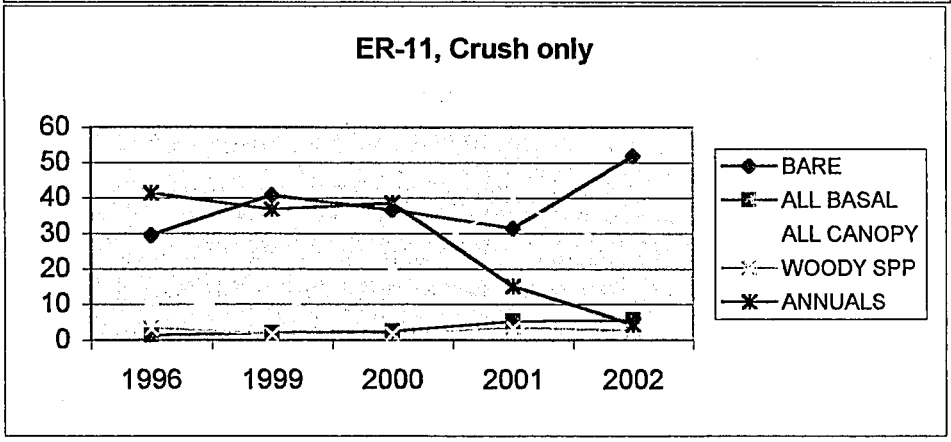

ER-9, Crush+seed
80
70
60
50
40
30
20
10
0
1996
1999
2000
2001
2002
BARE
ALL BASAL
ALL CANOPY
WOODY SPP
ANNUALS


ER-10, Crush+seed
80
70
60
50
40
30
20
10
0
1996
1999
2000
2001
2002
BARE
ALL BASAL
ALL CANOPY
WOODY SPP
ANNUALS


ER-4, Crush only
60
50
40
30
20
10
0
1996
1999
2000
2001
2002
BARE
ALL BASAL
ALL CANOPY
WOODY SPP
ANNUALS


ER-5, Crush only
60
50
40
30
20
10
0
1996
1999
2000
2001
2002
BARE
ALL BASAL
ALL CANOPY
WOODY SPP
ANNUALS


ER-7, Crush only
80
60
40
20
0
1996
1999
2000
2001
2002
BARE
ALL BASAL
ALL CANOPY
WOODY SPP
ANNUALS


ER-11, Crush only
60
50
40
30
20
10
0
1996
1999
2000
2001
2002
BARE
ALL BASAL
ALL CANOPY
WOODY SPP
ANNUALS

ER-1, Crush+seed	Means					t-test P			
	1996	1999	2000	2001	2002	96-99	96-00	96-01	96-02
SOIL		54.4	59.4	62.3	60.7				
ROCK		1.3	0.8	0.9	1.6				
BARE	63.1	55.7	60.2	63.2	62.3	0.09	0.36	0.98	0.80
LITTER	11.6	7.5	9.0	9.3	9.2	0.05	0.18	0.28	0.23
PRGL	13.6	7.0	9.8	11.7	15.1	0.00	0.10	0.35	0.50
FORB	1.4	15.8	8.6	1.1	1.5	0.00	0.00	0.64	0.90
ANN GRAS	1.3	3.2	4.1	0.4	0.1	0.02	0.02	0.12	0.04
EPHEDRA	1.1	0.2	0.1	0.1	0.1	0.00	0.00	0.00	0.00
ISTE	5.7	6.6	4.3	8.0	7.3	0.48	0.34	0.13	0.21
YUEL	0.7	0.2	0.2	0.0	0.6	0.07	0.07	0.01	0.75
TAAU	0.7	0.9	0.2	0.1	0.4	0.67	0.15	0.08	0.43
MUPO CAN	0.7	0.1	0.2	0.1	0	0.05	0.11	0.05	0.02
ARIS CAN	0.1	0.0	0.0	0.0	0	0.34	0.34	0.34	0.34
SEMA CAN	0.3	5.1	6.5	6.2	4.6	0.00	0.00	0.00	0.00
SEMA BAS	0.0	0.0	1.6	1.1	1.4				
SPOR CAN	0.0	0.0	0.0	0.3	0.6				
ALL BASAL	0.0	0.0	1.6	1.1	1.4		0.01	0.00	0.00
ALL CANOPY	1.1	5.2	6.7	6.6	5.2	0.00	0.00	0.01	0.00
WOODY SPP	15.4	7.4	10.1	11.8	15.7	0.00	0.03	0.08	0.89
ANNUALS	2.7	19.0	12.7	1.5	1.6	0.00	0.00	0.25	0.34

ER-2, Control	Means					t-test P			
	1996	1999	2000	2001	2002	96-99	96-00	96-01	96-02
SOIL		43.9	50.7	52.7	48.8				
ROCK		2.3	2.2	2.3	5.1				
BARE	50.2	46.1	52.9	55.0	53.9	0.27	0.44	0.28	0.16
PRGL	21.8	21.3	18.0	20.5	21.7	0.85	0.18	0.69	0.96
LITTER	13.9	7.9	9.7	8.1	10.8	0.02	0.02	0.01	0.13
ISTE	9.5	17.3	9.1	11.4	9.6	0.00	0.72	0.10	0.93
ANN FORB	2.7	5.8	6.4	0.4	1.2	0.07	0.03	0.12	0.31
ANN GRAS	2.0	0.6	3.0	0.8	0.1	0.19	0.44	0.27	0.08
MUPO CAN	1.7	2.0	1.8	1.5	1.7	0.69	0.90	0.82	1.00
EPHEDRA	0.9	0.9	1.2	0.6	1.1	0.96	0.66	0.53	0.66
GUSA	0.4	0.9	0.1	0.6	0.3	0.36	0.24	0.53	0.75
SOEL	0.2	0.0	0.0	0.0	0	0.34	0.34	0.34	0.34
ERLE CAN	0.2	0.0	0.5	0.4	0.6	0.34	0.26	0.59	0.33
SEMA CAN	0.2	1.1	2.3	3.7	1.2	0.04	0.02	0.00	0.02
ARIS CAN	0.1	0.0	0.0	0.1	0	0.34	0.34	1.00	0.34
ACOU	0.1	0.5	0.3	0.0	0	0.19	0.41	0.34	0.34
MIBI	0.1	0.1	0.0	0.3	0.3	0.88	0.34	0.41	0.41
YUEL	0.1	0.0	0.0	0.0	0	0.34	0.34	0.34	0.34
DICA CAN	0.1	0.0	0.1	0.0	0	0.34	1.00	0.34	0.34
SPOR CAN				0.3	0.6				
ALL BASAL	0.0	0.0	0.0	0.0	0				
ALL CANOPY	2.3	2.5	4.7	6.0	4.1	0.84	0.08	0.01	0.12
WOODY SPP	21.9	17.0	18.0	20.5	21.7	0.21	0.16	0.67	0.92
ANNUALS	4.7	5.1	9.4	1.2	1.3	0.84	0.05	0.06	0.07

ER-3, Crush+seed	Means					t-test P			
	1996	1999	2000	2001	2002	96-99	96-00	96-01	96-02
SOIL		27.1	40.0	26.1	49.5				
ROCK		2.0	1.6	3.0	3.5				
BARE	21.4	29.1	41.6	29.1	53.0	0.11	0.00	0.13	0.00
ANN GRAS	38.5	25.8	30.4	25.5	8.8	0.02	0.10	0.03	0.00
FORB	22.5	34.4	6.2	16.0	0.5	0.00	0.00	0.08	0.00
LITTER	8.0	5.6	12.9	12.0	20.1	0.23	0.01	0.03	0.00
ISTE	7.3	3.7	1.1	4.5	4.3	0.00	0.00	0.03	0.01
PRGL	5.9	3.9	2.7	3.8	3.1	0.23	0.01	0.12	0.01
MUPO CAN	4.2	1.1	0.4	0.5	0.6	0.01	0.00	0.00	0.00
SPCO CAN	1.5	0.3	1.7	2.5	4.8	0.01	0.83	0.39	0.09
EPHEDRA	1.2	0.6	0.0	0.7	1.0	0.12	0.00	0.15	0.64
SEMA CAN	0.8	1.8	3.2	6.7	2.2	0.13	0.00	0.00	0.11
DICA BAS	0.5	0.0	0.0	0.0	0	0.24	0.24	0.24	0.24
DICA CAN	0.3	0.0	0.0	0.0	0	0.19	0.19	0.19	0.19
SPCO BAS	0.3	0.1	0.2	0.3	0	0.29	0.70	1.00	0.08
MUPO BAS	0.3	0.2	0.0	0.0	0.1	0.63	0.08	0.08	0.29
GUSA	0.2	0.5	0.0	0.7	0	0.34	0.17	0.15	0.17
ERLE CAN	0.2	0.4	2.1	4.1	3.8	0.56	0.01	0.00	0.00
SEMA BAS	0.2	0.4	0.8	0.7	0.7	0.45	0.11	0.19	0.15
ZIGR	0.1	0.0	0.0	0.0	0	0.34	0.34	0.34	0.34
BOER CAN	0.1	0.0	0.0	0.0	0	0.34	0.34	0.34	0.34
4WING	0.1	0.2	0.0	0.0	0	0.66	0.34	0.34	0.34
ARIS CAN	0.1	0.0	0.1	0.1	0.1	0.34	1.00	1.00	1.00
SPFL CAN	0.1	0.0	0.0	0.6	0.1	0.34	0.34	0.35	1.00
ALL BASAL	1.3	0.7	1.0	1.0	0.8	0.30	0.60	0.61	0.36
ALL CANOPY	7.7	3.9	5.4	11.1	7.9	0.02	0.20	0.13	0.92
WOODY SPP	5.9	3.9	2.7	3.8	3.1	0.23	0.01	0.12	0.01
ANNUALS	61.0	60.2	36.6	41.5	9.3	0.91	0.00	0.03	0.00

ER-4, Crush only	Means					t-test P			
	1996	1999	2000	2001	2002	96-99	96-00	96-01	96-02
SOIL		38.8	39.5	45.1	53.3				
ROCK		2.6	3.5	1.7	3.3				
BARE	36.9	41.4	43.0	46.8	56.6	0.11	0.24	0.01	0.00
LITTER	10.2	6.9	8.0	10.6	14.8	0.19	0.37	0.87	0.10
PRGL	9.3	3.5	4.9	5.0	7.3	0.00	0.03	0.02	0.38
ANN FORB	13.7	32.9	9.2	5.7	0.7	0.00	0.04	0.00	0.00
ANN GRAS	16.5	9.6	25.4	6.4	2	0.03	0.09	0.00	0.00
ISTE	10.2	6.5	2.2	9.7	5	0.05	0.00	0.76	0.01
SPCO CAN	1.0	0.1	1.5	2.8	4.4	0.04	0.46	0.09	0.00
EPHEDRA	0.6	0.2	0.0	0.0	0.4	0.14	0.02	0.02	0.57
SEMA BAS	0.1	0.2	1.0	1.4	0.6	0.56	0.04	0.01	0.02
SEMA CAN	1.3	1.6	4.8	7.2	3.8	0.68	0.02	0.00	0.02
MUPO CAN	2.3	0.4	0.5	0.6	0.9	0.01	0.02	0.02	0.09
DICA CAN	0.3	0.2	0.0	0.1	0	0.63	0.08	0.29	0.08
ARIS BAS	0.3	0.0	0.1	0.2	0.1	0.08	0.29	0.63	0.29
ARIS CAN	1.1	0.1	0.1	0.2	0.2	0.04	0.04	0.06	0.07
ERLE BAS	0.0	0.0	0.0	0.0	0.7				0.07
ERLE CAN	0.3	1.6	4.6	6.6	6	0.06	0.01	0.02	0.00
CABA	0.1	0.0	0.0	0.0	0	0.34	0.34	0.34	0.34
SPFL CAN	0.3	0.0	0.0	0.6	0	0.08	0.08	0.40	0.08
YUEL	0.2	0.0	0.1	0.1	0.2	0.17	0.56	0.56	1.00
CRCO	0.6	0.0	0.0	0.0	0.2	0.11	0.11	0.11	0.30
TAAU	0.4	0.2	0.1	0.2	0	0.45	0.24	0.51	0.10
GUSA	0.1	0.5	0.0	0.1	0.4	0.13	0.34	1.00	0.24
DAPU CAN	0.1	0.1	0.0	0.0	0.1	1.00	0.34	0.34	1.00
ACOU	0.1	0.1	0.0	0.0	0	1.00	0.34	0.34	0.34
SOEL	0.1	0.0	0.2	0.0	0.2	0.34	0.56	0.34	0.56
OPLEP	0.1	0.0	0.0	0.0	0	0.34	0.34	0.34	0.34
ALL BASAL	0.4	0.2	1.1	1.6	0.7	0.36	0.09	0.03	0.20
ALL CANOPY	6.7	4.1	11.5	18.1	15.4	0.14	0.10	0.00	0.00
WOODY SPP	9.6	3.5	5.0	5.1	7.5	0.00	0.02	0.01	0.36
ANNUALS	30.2	42.5	34.6	12.1	2.7	0.00	0.46	0.00	0.00

ER-5, Crush only	Means					t-test P			
	1996	1999	2000	2001	2002	96-99	96-00	96-01	96-02
SOIL		38.4	35.8	42.1	54.4				
ROCK		2.6	3.1	2.4	5.3				
BARE	34.2	41.0	38.9	44.5	59.7	0.01	0.13	0.05	0.00
LITTER	8.6	3.9	5.9	8.8	10.1	0.01	0.13	0.91	0.44
FORB	14.1	32.9	15.9	4.0	1	0.00	0.22	0.00	0.00
PRGL	12.6	5.9	4.2	8.0	5.8	0.01	0.00	0.13	0.00
ANN GRAS	24.2	11.6	25.6	9.5	3.1	0.00	0.72	0.00	0.00
SPCO BAS	0.1	0.0	0.2	0.3	0.4	0.34	0.66	0.41	0.31
SPCO CAN	0.5	0.1	1.2	1.7	1.2	0.19	0.18	0.15	0.16
ISTE	2.0	1.2	1.0	3.5	2.9	0.32	0.20	0.13	0.31
ARIS BAS	0.3	0.2	0.1	0.2	0.2	0.63	0.29	0.63	0.63
ARIS CAN	3.0	0.3	0.7	0.9	0.3	0.00	0.01	0.02	0.00
EPHEDRA	0.8	0.3	0.8	0.2	0.3	0.10	1.00	0.02	0.06
TAAU	0.8	0.3	0.5	0.0	0	0.22	0.49	0.04	0.04
SEMA BAS	0.2	0.1	0.9	1.3	0.8	0.56	0.19	0.01	0.05
SEMA CAN	1.2	0.7	3.5	6.3	2.2	0.47	0.01	0.01	0.05
CRCO	0.1	0.1	0.0	0.1	0.1	1.00	0.34	1.00	1.00
GUSA	1.7	3.3	0.3	2.7	3.9	0.10	0.03	0.24	0.02
MUPO BAS	0.3	0.1	0.0	0.0	0.1	0.29	0.08	0.08	0.29
MUPO CAN	2.2	0.7	0.9	0.5	0.4	0.03	0.04	0.00	0.00
YUEL	0.4	0.3	0.5	0.2	0.2	0.66	0.75	0.36	0.36
ERLE BAS	0.2	0.2	0.4	1.6	1.8	1.00	0.45	0.04	0.00
ERLE CAN	0.6	3.5	7.9	12.8	9.7	0.02	0.00	0.00	0.00
SPSP	0.1	0.0	0.1	0.1	0	0.34	1.00	1.00	0.34
DICA BAS	0.0	0.0	0.1	0.0	0.1		0.34		0.34
DICA CAN	0.3	0.0	0.3	0.0	0.2	0.08	1.00	0.08	0.63
ACOU	0.3	0.7	0.1	0.0	0	0.41	0.41	0.19	0.19
ALL BASAL	1.1	0.6	1.7	3.4	3.4	0.32	0.49	0.01	0.01
ALL CANOPY	7.8	5.3	14.5	22.2	14.0	0.11	0.00	0.00	0.00
WOODY SPP	13.0	6.2	4.7	8.2	6.0	0.01	0.00	0.11	0.01
ANNUALS	38.3	44.5	41.5	13.5	4.1	0.06	0.46	0.00	0.00

ER-6, Control	Means					t-test P			
	1996	1999	2000	2001	2002	96-99	96-00	96-01	96-02
SOIL		41.8	42.5	38.7	53.4				
ROCK		1.8	1.7	2.1	3.2				
BARE	27.3	43.5	44.2	40.8	56.6	0.00	0.01	0.01	0.00
LITTER	8.7	5.8	8.7	14.0	11.0	0.03	1.00	0.00	0.14
ANN FORB	19.1	18.9	9.0	1.2	1.1	0.95	0.01	0.00	0.00
PRGL	7.1	4.6	6.2	7.3	6.4	0.17	0.71	0.90	0.68
ANN GRAS	22.6	5.6	19.6	9.5	1.5	0.01	0.62	0.03	0.00
ARIS BAS	0.4	0.6	0.2	0.6	0.7	0.56	0.51	0.53	0.39
ARIS CAN	4.2	2.3	1.3	2.7	2.2	0.07	0.01	0.20	0.05
EPHEDRA	1.0	0.6	0.3	1.1	0.7	0.28	0.02	0.75	0.46
MUPO BAS	0.0	0.0	0.3	1.2	0.5		0.34	0.01	0.01
MUPO CAN	1.2	3.1	3.4	3.9	3.7	0.14	0.00	0.02	0.01
SEMA BAS	0.4	0.3	0.3	0.3	0.4	0.59	0.75	0.75	1.00
SEMA CAN	1.2	1.3	1.2	2.9	0.7	0.94	1.00	0.02	0.32
ISTE	6.8	12.1	2.3	4.5	4.1	0.00	0.00	0.02	0.03
GUSA	0.6	1.5	0.0	0.3	0.8	0.10	0.11	0.47	0.66
SPCO BAS	0.0	0.0	0.1	0.3	0.3		0.34	0.08	0.19
SPCO CAN	0.4	0.1	0.2	0.8	0.9	0.20	0.36	0.25	0.18
CRCO	0.5	0.1	0.2	0.4	1.2	0.28	0.39	0.79	0.24
ERLE BAS	0.7	0.1	0.5	2.9	2.1	0.07	0.68	0.05	0.12
ERLE CAN	6.5	6.5	10.0	16.4	10.8	1.00	0.32	0.02	0.24
YUEL	1.1	0.5	0.3	1.1	0.7	0.14	0.02	1.00	0.37
CABA	0.1	0.0	0.0	0.0	0	0.34	0.34	0.34	0.34
DICA BAS	0.0	0.0	0.0	0.0	0				
DICA CAN	0.1	0.1	0.1	0.0	0	0.88	1.00	0.34	0.34
BORO CAN	0.0	0.0	0.0	0.0	1.3				0.03
ALL BASAL	1.5	0.8	1.4	5.3	4	0.25	0.91	0.00	0.01
ALL CANOPY	13.6	10.7	16.2	26.7	18.3	0.41	0.52	0.00	0.14
WOODY SPP	8.2	4.1	6.5	8.4	7.1	0.05	0.50	0.91	0.56
ANNUALS	41.7	19.6	28.6	10.7	2.6	0.01	0.12	0.00	0.00

ER-7, Crush only	Means					t-test P			
	1996	1999	2000	2001	2002	96-99	96-00	96-01	96-02
SOIL		48.4	49.4	48.6	58.5				
ROCK		2.1	2.8	1.6	3.9				
BARE	56.7	50.5	52.2	50.2	62.4	0.09	0.20	0.18	0.16
LITTER	14.3	6.7	8.7	14.8	11.3	0.00	0.00	0.85	0.16
ANN FORB	5.5	23.0	8.5	1.4	1.4	0.00	0.12	0.01	0.01
PRGL	10.4	7.1	4.9	12.5	8.7	0.22	0.03	0.55	0.52
ANN GRAS	2.0	6.1	16.0	3.0	1	0.06	0.00	0.45	0.22
ISTE	8.1	6.9	3.3	3.0	5.3	0.23	0.00	0.00	0.01
TAAU	0.5	0.3	0.3	0.0	0.8	0.47	0.47	0.05	0.54
DAPU BAS	0.1	0.0	0.0	0.0	0	0.34	0.34	0.34	0.34
DAPU CAN	0.1	0.0	0.0	0.0	0	0.34	0.34	0.34	0.34
EPHEDRA	0.4	0.1	0.0	0.7	0.1	0.14	0.04	0.52	0.14
ERLE BAS	0.0	0.0	0.7	0.2	1.7		0.07	0.17	0.01
ERLE CAN	1.2	1.6	8.0	1.4	8.9	0.78	0.03	0.86	0.01
GUSA	0.3	0.4	0.2	3.3	0.1	0.66	0.70	0.00	0.29
ARIS BAS	0.0	0.0	0.0	0.1	0.1			0.34	0.34
ARIS CAN	0.6	0.0	0.0	1.5	0.1	0.08	0.08	0.07	0.15
SEMA BAS	0.0	0.1	0.4	0.9	0.5	0.34	0.10	0.02	0.05
SEMA CAN	0.1	1.2	2.5	5.0	1.6	0.04	0.01	0.00	0.00
SPOR BAS				1.2	0				
SPOR CAN				6.7	1.1				
MUPO BAS				0.4	0				
MUPO CAN				2.2	0.1				
ALL BASAL	0.1	0.1	1.1	2.8	2.3	1.00	0.01	0.01	0.01
ALL CANOPY	2.0	2.8	10.5	16.2	11.8	0.66	0.02	0.00	0.01
WOODY SPP	10.4	7.1	4.9	12.5	8.7	0.22	0.03	0.55	0.52
ANNUALS	7.5	29.1	24.5	4.4	2.4	0.00	0.00	0.18	0.02

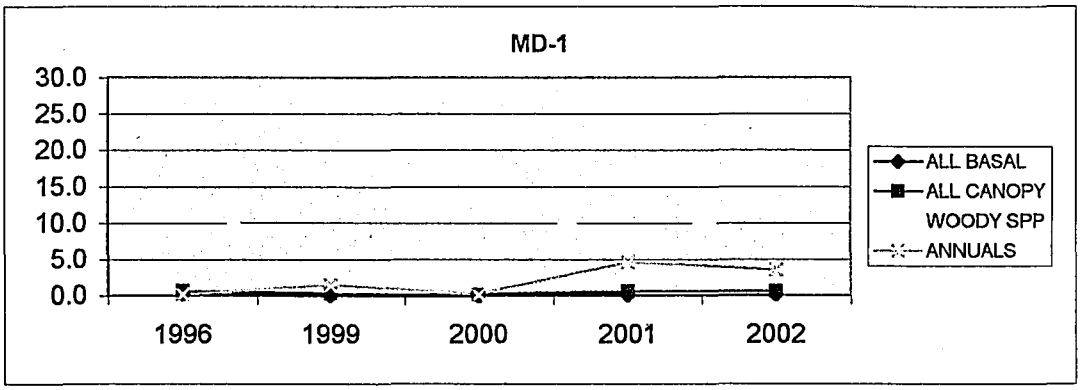
ER-8, Control	Means					t-test P			
	1996	1999	2000	2001	2002	96-99	96-00	96-01	96-02
SOIL		39.6	44.8	51.6	51.2				
ROCK		2.9	0.9	2.1	1.8				
BARE	29.9	42.5	45.7	53.7	53	0.02	0.01	0.00	0.00
LITTER	11.9	4.6	7.5	11.5	13.6	0.00	0.01	0.85	0.28
ANN FORB	21.8	22.0	11.7	1.8	1.4	0.95	0.00	0.00	0.00
PRGL	10.0	11.5	11.0	7.6	13.4	0.61	0.69	0.26	0.22
ANN GRAS	19.6	7.3	17.2	1.8	1.1	0.00	0.60	0.00	0.00
ISTE	3.0	4.6	1.0	10.3	3.4	0.31	0.03	0.00	0.67
ACOU	0.2	0.1	0.1	0.0	0	0.76	0.66	0.34	0.34
ARIS BAS	0.2	0.3	0.0	0.0	0.6	0.82	0.17	0.17	0.07
ARIS CAN	3.3	1.5	1.7	0.0	2.2	0.03	0.06	0.00	0.17
GUSA	1.2	6.6	0.5	0.2	1.8	0.00	0.12	0.02	0.35
YUEL	0.3	0.4	0.2	0.0	0.2	0.76	0.63	0.08	0.63
SPCO BAS	0.6	0.0	0.3	0.0	0.8	0.05	0.35	0.05	0.62
SPCO CAN	2.7	1.0	1.7	1.1	6.5	0.10	0.35	0.18	0.01
MUPO BAS	0.1	0.3	0.5	0.0	0.5	0.45	0.19	0.34	0.24
MUPO CAN	2.3	2.9	4.4	0.0	3.4	0.43	0.05	0.00	0.29
DICA BAS	0.1	0.0	0.0	0.0	0.1	0.34	0.34	0.34	1.00
DICA CAN	0.2	0.0	0.4	0.0	0.1	0.17	0.36	0.17	0.56
SPFL BAS	0.0	0.0	0.0	0.0	0				
SPFL CAN	0.2	0.0	0.0	0.0	0	0.34	0.34	0.34	0.34
EPHEDRA	1.1	0.1	0.4	0.0	1	0.10	0.24	0.07	0.87
SEMA BAS	0.0	0.1	0.9	1.3	0.3	0.35	0.03	0.02	0.19
SEMA CAN	0.4	3.0	4.0	3.7	2	0.00	0.02	0.00	0.01
CRCO	0.1	0.0	0.0	0.0	0	0.34	0.34	0.34	0.34
ERLE BAS	0.1	0.0	0.2	1.3	0.2	0.34	0.56	0.03	0.66
ERLE CAN	0.2	0.4	0.9	10.0	1.5	0.67	0.13	0.00	0.14
TAAU				0.4	0.1				
ALL BASAL	1.1	0.5	1.9	2.6	2.5	0.14	0.16	0.11	0.04
ALL CANOPY	9.3	7.0	13.1	14.8	15.7	0.26	0.12	0.12	0.01
WOODY SPP	10.3	9.5	11.2	7.6	13.6	0.79	0.72	0.20	0.22
ANNUALS	41.4	23.4	28.9	3.6	2.5	0.02	0.08	0.00	0.00

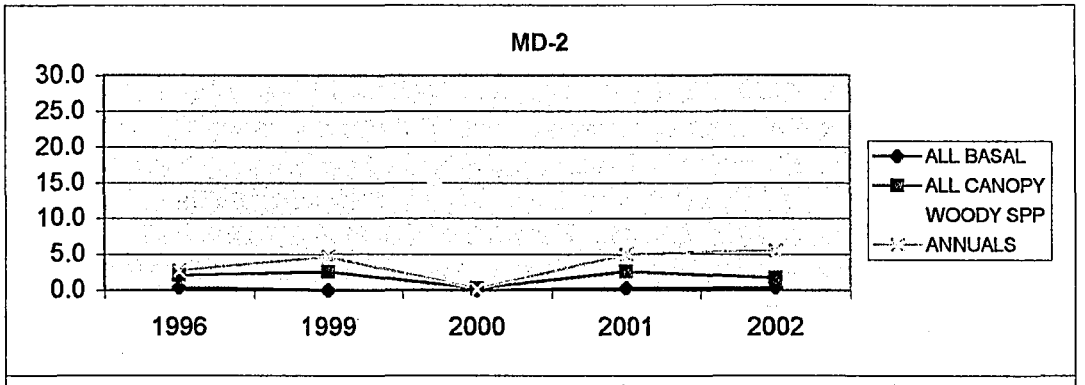
ER-9, Crush+seed	Means					t-test P			
	1996	1999	2000	2001	2002	96-99	96-00	96-01	96-02
SOIL		26.9	37.7	30.0	41.4				
ROCK		8.4	9.1	6.3	9.7				
BARE	17.2	35.3	46.8	36.3	51.1	0.00	0.00	0.00	0.00
LITTER	12.2	5.5	11.0	11.5	16.4	0.11	0.78	0.86	0.33
ANN FORB	29.1	34.3	6.6	7.3	1.4	0.11	0.00	0.00	0.00
PRGL	9.9	4.3	6.4	8.1	5.9	0.02	0.13	0.44	0.08
ANN GRAS	42.7	23.9	19.7	10.9	7	0.00	0.00	0.00	0.00
ISTE	3.5	1.7	3.0	6.3	5.3	0.01	0.50	0.07	0.18
GUSA	0.7	0.2	0.1	0.6	0.1	0.15	0.08	0.79	0.08
EPHEDRA	2.4	1.0	0.5	1.8	1.3	0.13	0.03	0.47	0.18
ARIS BAS	0.0	0.0	0.0	0.0	0				
ARIS CAN	0.2	0.0	0.0	0.0	0	0.17	0.17	0.17	0.17
MUPO BAS	0.4	0.0	0.1	0.5	0.4	0.17	0.31	0.78	1.00
MUPO CAN	3.9	0.6	0.4	1.5	0.9	0.02	0.01	0.08	0.03
ERLE BAS	0.2	0.0	0.3	0.3	0.6	0.34	0.70	0.74	0.20
ERLE CAN	0.8	0.1	3.7	8.6	6.8	0.07	0.00	0.00	0.00
SPCO BAS	0.0	0.0	0.1	0.1	0		0.34	0.34	
SPCO CAN	0.1	0.1	0.4	1.5	1.1	1.00	0.31	0.17	0.04
DICA BAS	0.2	0.0	0.0	0.1	0	0.17	0.17	0.56	0.17
DICA CAN	0.4	0.0	0.2	0.5	0.3	0.04	0.36	0.67	0.71
DAPU BAS	0.3	0.0	0.0	0.0	0	0.19	0.19	0.19	0.19
DAPU CAN	0.5	0.0	0.0	0.0	0	0.10	0.10	0.10	0.10
YUEL	0.7	0.2	0.2	0.1	0.1	0.19	0.19	0.12	0.12
BARREL	0.1	0.0	0.0	0.0	0	0.34	0.34	0.34	0.34
CHLI	0.4	0.2	0.6	0.3	0.5	0.51	0.68	0.75	0.75
SEMA BAS	0.0	0.1	0.9	1.5	0.7	0.34	0.07	0.00	0.02
SEMA CAN	0.3	1.6	4.7	10.2	3.5	0.06	0.00	0.00	0.00
TAAU	0.1	0.0	0.0	0.0	0	0.34	0.34	0.34	0.34
ALL BASAL	1.1	0.1	1.4	2.5	1.7	0.04	0.71	0.05	0.27
ALL CANOPY	6.2	2.4	9.4	22.3	12.6	0.01	0.08	0.00	0.01
WOODY SPP	10.6	4.5	6.6	8.2	6	0.02	0.10	0.33	0.05
ANNUALS	71.8	58.2	26.3	18.2	8.4	0.02	0.00	0.00	0.00

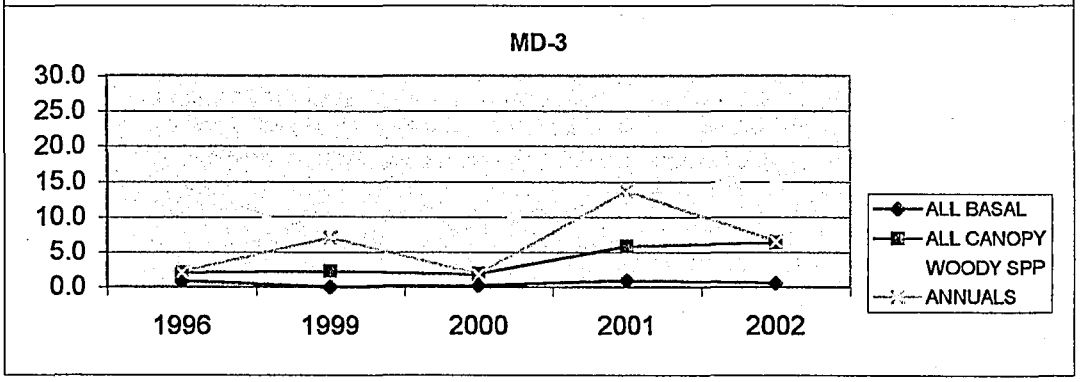
ER-10, Crush+seed	Means					t-test P			
	1996	1999	2000	2001	2002	96-99	96-00	96-01	96-02
SOIL		42.1	45.8	53.9	63.8				
ROCK		3.5	3.3	2.1	5				
BARE	33.5	45.6	49.1	55.0	68.8	0.00	0.00	0.00	0.00
LITTER	6.0	6.7	7.1	10.5	8.3	0.57	0.28	0.00	0.09
ANN FORB	13.7	27.2	11.0	3.2	1.9	0.00	0.14	0.00	0.00
PRGL	4.0	2.3	2.6	3.2	3.8	0.20	0.27	0.57	0.88
ANN GRAS	36.3	14.1	29.7	15.6	7.8	0.00	0.18	0.00	0.00
MUPO BAS	0.1	0.3	0.0	0.2	0.1	0.41	0.34	0.56	1.00
MUPO CAN	2.8	0.5	0.4	0.3	0.7	0.01	0.01	0.01	0.02
DICA BAS	0.0	0.1	0.2	0.0	0	0.34	0.17		
DICA CAN	0.1	0.2	0.4	0.0	0.2	0.56	0.24	0.34	0.56
ISTE	7.6	5.7	1.4	4.7	3.8	0.30	0.00	0.09	0.04
ERLE BAS	0.0	0.0	0.0	0.2	0.1			0.17	0.34
ERLE CAN	0.2	0.2	0.8	1.8	1.4	1.00	0.05	0.02	0.11
ARIS BAS	0.1	0.0	0.0	0.0	0	0.34	0.34	0.34	0.34
ARIS CAN	1.5	0.3	0.0	0.4	0.1	0.01	0.00	0.02	0.00
YUEL	0.5	0.6	0.4	0.4	0.9	0.78	0.75	0.75	0.28
SEMA BAS	0.0	0.0	0.5	0.6	0.2		0.05	0.01	0.17
SEMA CAN	0.6	0.7	2.8	3.8	2.5	0.79	0.00	0.01	0.03
EPHEDRA	0.3	0.1	0.1	0.0	0.3	0.41	0.41	0.19	1.00
GUSA	0.3	0.5	0.0	0.4	0.3	0.47	0.08	0.71	1.00
TARBUSH	0.1	0.0	0.0	0.0	0	0.34	0.34	0.34	0.34
CRCO	0.1	0.0	0.0	0.0	0	0.34	0.34	0.34	0.34
CODI	0.1	0.0	0.0	0.0	0	0.34	0.34	0.34	0.34
BORO CAN	0.0	0.0	0.0	0.0	0.5				0.14
ALL BASAL	0.2	0.4	0.7	1.0	0.4	0.45	0.11	0.01	0.45
ALL CANOPY	5.2	1.9	4.4	6.3	4.9	0.00	0.44	0.32	0.84
WOODY SPP	4.6	2.9	3.0	3.6	4.7	0.22	0.23	0.52	0.94
ANNUALS	50.0	41.3	40.7	18.8	9.7	0.13	0.12	0.00	0.00

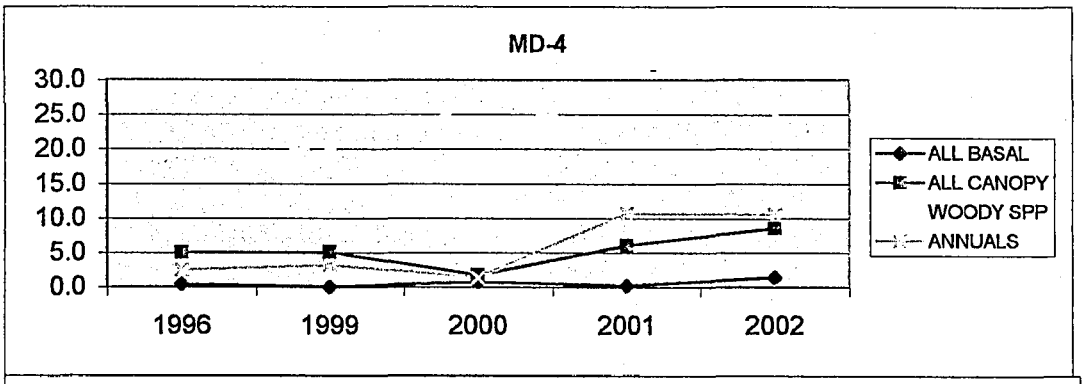
ER-11, Crush only	Means					t-test P			
	1996	1999	2000	2001	2002	96-99	96-00	96-01	96-02
SOIL		37.6	33.3	29.0	46.4				
ROCK		3.1	3.4	2.3	5.5				
BARE	29.3	40.7	36.7	31.3	51.9	0.00	0.12	0.64	0.00
LITTER	10.5	8.3	7.1	10.4	12.7	0.08	0.02	0.93	0.20
ANN FORB	16.0	27.8	6.6	2.2	1.4	0.00	0.00	0.00	0.00
PRGL	2.6	1.6	1.7	2.7	2	0.40	0.40	0.94	0.57
ANN GRAS	25.3	9.0	32.0	12.9	2.9	0.00	0.17	0.00	0.00
YUEL	0.6	0.0	0.2	0.8	0.5	0.08	0.25	0.66	0.79
ISTE	8.5	4.7	2.3	4.8	3.9	0.02	0.00	0.02	0.01
ARIS BAS	0.2	0.2	0.1	0.0	0.1	1.00	0.66	0.34	0.66
ARIS CAN	4.6	1.2	0.2	0.7	0.8	0.00	0.00	0.00	0.00
TAAU	0.2	0.0	0.0	0.0	0.1	0.17	0.17	0.17	0.56
EPHEDRA	0.9	0.3	0.1	0.1	0.4	0.11	0.03	0.03	0.18
BOBA BAS	0.0	0.0	0.0	0.0	0				
BOBA CAN	0.1	0.0	0.1	0.1	0	0.34	1.00	1.00	0.34
GUSA	1.8	1.3	0.0	0.3	0.9	0.49	0.01	0.02	0.18
DICA BAS	0.1	0.0	0.0	0.0	0	0.34	0.34	0.34	0.34
DICA CAN	0.2	0.0	0.3	0.0	0.2	0.17	0.63	0.17	1.00
SEMA BAS	0.1	0.1	0.2	0.4	0.2	1.00	0.66	0.24	0.56
SEMA CAN	0.2	0.2	1.8	1.9	0.8	1.00	0.01	0.03	0.17
MUPO BAS	0.4	1.0	0.1	0.5	0.2	0.25	0.24	0.75	0.45
MUPO CAN	2.2	0.0	0.3	1.5	1.3	0.01	0.02	0.38	0.29
ERIN BAS	0.0	0.0	0.0	0.0	0				
ERIN CAN	0.1	0.0	0.0	0.0	0	0.34	0.34	0.34	0.34
ERLE BAS	0.0	0.5	2.0	4.2	4.6	0.10	0.08	0.01	0.00
ERLE CAN	2.3	5.7	16.4	32.7	19.1	0.01	0.00	0.00	0.00
SPCO BAS	0.2	0.2	0.1	0.1	0.6	1.00	0.66	0.66	0.29
SPCO CAN	1.6	0.3	0.8	0.5	2.1	0.04	0.21	0.09	0.58
SPFL BAS	0.2	0.0	0.0	0.1	0	0.34	0.34	0.66	0.34
SPFL CAN	0.4	0.0	0.0	1.5	0	0.10	0.10	0.11	0.10
BORO CAN	0.0	0.0	0.0	0.0	1				0.00
ALL BASAL	1.2	2.0	2.5	5.3	5.7	0.39	0.35	0.01	0.00
ALL CANOPY	11.7	7.4	19.9	38.9	24.3	0.01	0.01	0.00	0.00
WOODY SPP	3.2	1.6	1.9	3.5	2.5	0.20	0.24	0.84	0.55
ANNUALS	41.3	36.8	38.6	15.1	4.3	0.18	0.53	0.00	0.00

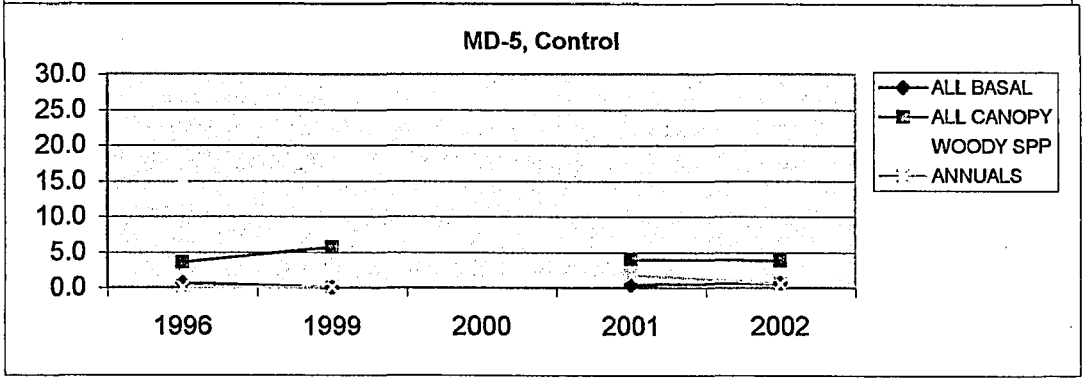
ER-12, Control	Means					t-test P			
	1996	1999	2000	2001	2002	96-99	96-00	96-01	96-02
SOIL		38.8	36.8	35.3	49.7				
ROCK		1.6	0.7	1.9	4				
BARE	24.7	40.4	37.5	37.2	53.7	0.01	0.04	0.03	0.00
LITTER	6.8	6.3	6.8	13.2	12.9	0.78	1.00	0.02	0.00
ANN FORB	20.6	19.8	7.7	2.4	0.4	0.84	0.00	0.00	0.00
PRGL	3.6	3.3	5.9	5.9	4.2	0.68	0.09	0.17	0.53
ANN GRAS	30.2	5.8	26.0	3.5	0.2	0.00	0.53	0.00	0.00
ISTE	4.6	8.4	1.1	2.9	3	0.02	0.00	0.13	0.14
ARIS BAS	0.5	0.5	0.3	0.4	0.1	1.00	0.53	0.78	0.13
ARIS CAN	4.6	4.0	1.7	1.6	1.7	0.73	0.02	0.02	0.02
MUPO BAS	0.0	0.1	0.5	0.5	0.6	0.35	0.05	0.14	0.02
MUPO CAN	1.6	2.1	2.9	3.0	2.4	0.57	0.06	0.08	0.27
SEMA BAS	0.2	0.0	0.2	0.2	0.1	0.17	1.00	1.00	0.56
SEMA CAN	0.6	1.1	1.8	2.2	0.2	0.25	0.07	0.04	0.20
EPHEDRA	0.1	0.4	0.3	1.0	0.6	0.21	0.29	0.06	0.19
CRCO	0.7	0.1	0.1	0.2	0.2	0.10	0.08	0.15	0.15
TAAU	0.3	0.0	0.1	0.3	0	0.08	0.29	1.00	0.08
ERLE BAS	0.2	0.5	2.1	4.9	5.0	0.22	0.03	0.00	0.00
ERLE CAN	7.2	10.4	15.9	31.8	21.2	0.14	0.00	0.00	0.00
SOEL	0.1	0.0	0.0	0.1	0	0.34	0.34	1.00	0.34
GUSA	1.5	2.9	0.0	0.6	0.5	0.14	0.01	0.14	0.08
YUEL	0.5	0.5	0.8	0.4	0.5	1.00	0.43	0.79	1.00
SPCO BAS	0.1	0.0	0.0	0.2	0	0.34	0.34	0.56	0.34
SPCO CAN	0.4	0.1	0.2	0.5	0.2	0.30	0.51	0.78	0.45
SPFL CAN	0.1	0.0	0.0	0.0	0	0.34	0.34	0.34	0.34
ALL BASAL	1.0	0.9	3.1	6.2	5.8	0.84	0.09	0.00	0.00
ALL CANOPY	14.5	14.2	22.5	39.1	25.7	0.93	0.00	0.00	0.00
WOODY SPP	4.1	3.0	6.7	6.3	4.7	0.27	0.07	0.19	0.57
ANNUALS	50.8	20.4	33.7	5.9	0.6	0.00	0.01	0.00	0.00


MD-1
30.0
25.0
20.0
15.0
10.0
5.0
0.0
1996
1999
2000
2001
2002
ALL BASAL
ALL CANOPY
WOODY SPP
ANNUALS


MD-2
30.0
25.0
20.0
15.0
10.0
5.0
0.0
1996
1999
2000
2001
2002
ALL BASAL
ALL CANOPY
WOODY SPP
ANNUALS


MD-3
30.0
25.0
20.0
15.0
10.0
5.0
0.0
1996
1999
2000
2001
2002
ALL BASAL
ALL CANOPY
WOODY SPP
ANNUALS


MD-4
30.0
25.0
20.0
15.0
10.0
5.0
0.0
1996
1999
2000
2001
2002
ALL BASAL
ALL CANOPY
WOODY SPP
ANNUALS


MD-5, Control
30.0
25.0
20.0
15.0
10.0
5.0
0.0
1996
1999
2000
2001
2002
ALL BASAL
ALL CANOPY
WOODY SPP
ANNUALS

MD-1	Means					t-test P			
	1996	1999	2000	2001	2002	96-99	96-00	96-01	96-02
SOIL		51.6	67.9	62.3	62.4				
ROCK		2.1	4.1	2.1	2.9				
BARE	81.3	53.7	72.0	64.4	65.3	0.00	0.02	0.00	0.00
LITTER	5.7	35.6	18.3	19.5	8.5	0.00	0.00	0.00	0.07
ANN FORB	0.1	1.3	0.2	3.9	3.5	0.09	0.56	0.01	0.02
PRGL	11.1	6.1	7.7	10.9	8.2	0.05	0.19	0.94	0.24
ANN GRAS	0.1	0.1	0.0	0.6	0.0	1.00	0.34	0.15	0.34
GUSA	1.3	0.4	0.0	0.2	0.6	0.13	0.03	0.06	0.22
XMAS	0.1	0.0	0.0	0.0	0.0	0.34	0.34	0.34	0.34
MUPO BAS	0.0	0.0	0.0	0.0	0.1				0.34
MUPO CAN	0.2	0.1	0.0	0.0	0.4	0.56	0.17	0.17	0.45
HIMU BAS	0.2	0.0	0.0	0.0	0.0	0.34	0.34	0.34	0.34
HIMU CAN	0.4	0.2	0.2	0.5	0.1	0.56	0.56	0.81	0.37
PPEAR	0.1	0.6	0.4	0.2	0.9	0.35	0.24	0.56	0.12
4WING	0.2	1.1	0.5	0.2	0.6	0.06	0.18	1.00	0.30
ALL BASAL	0.2	0.0	0.0	0.0	0.1	0.34	0.34	0.34	0.66
ALL CANOPY	0.6	0.3	0.2	0.5	0.5	0.43	0.25	0.81	0.79
WOODY SPP	11.4	7.2	8.2	11.1	8.8	0.10	0.23	0.91	0.28
ANNUALS	0.2	1.4	0.2	4.5	3.5	0.09	1.00	0.00	0.02

MD-2	Means					t-test P			
	1996	1999	2000	2001	2002	96-99	96-00	96-01	96-02
SOIL		54.9	58.9	53.0	64.3				
ROCK		6.3	5.7	5.6	5.2				
BARE	75.4	61.2	64.6	58.6	69.5	0.00	0.04	0.01	0.02
LITTER	5.2	20.4	17.8	17.6	5.5	0.00	0.01	0.01	0.84
ANN FORB	0.3	1.3	0.2	3.4	3.5	0.07	0.63	0.04	0.00
PRGL	13.6	12.1	16.0	16.6	18.4	0.37	0.28	0.22	0.01
ANN GRAS	2.4	3.4	0.0	1.5	2.0	0.57	0.06	0.49	0.75
GUSA	1.9	0.8	0.0	0.1	0.1	0.16	0.02	0.03	0.36
SPWR BAS	0.4	0.0	0.0	0.2	0.2	0.10	0.10	0.45	0.24
SPWR CAN	1.0	1.6	0.1	1.6	0.5	0.30	0.09	0.44	0.39
SEMA BAS	0.0	0.0	0.0	0.1	0.1			0.34	0.08
SEMA CAN	0.4	0.8	0.2	0.8	0.9	0.29	0.45	0.29	0.18
MUPO BAS	0.0	0.0	0.0	0.0	0.0				
MUPO CAN	0.7	0.2	0.0	0.2	0.3	0.22	0.07	0.19	0.30
MIBI	0.1	0.1	0.0	0.0	0.0	1.00	0.34	0.34	0.34
TARBUSH	0.1	0.0	0.0	0.0	0.0	0.34	0.34	0.34	0.34
P PEAR				0.3	0.0				
CRUX THORN				0.3	0.1				
ALL BASAL	0.4	0.0	0.0	0.3	0.4	0.10	0.10	0.71	1.00
ALL CANOPY	2.1	2.6	0.3	2.6	1.7	0.34	0.00	0.47	0.50
WOODY SPP	13.7	12.1	16.0	16.9	18.5	0.34	0.30	0.21	0.01
ANNUALS	2.7	4.7	0.2	4.9	5.5	0.34	0.06	0.31	0.08

MD-3	Means					t-test P			
	1996	1999	2000	2001	2002	96-99	96-00	96-01	96-02
SOIL		59.0	51.8	39.8	54.8				
ROCK		3.6	4.0	3.0	1.6				
BARE	69.8	62.6	55.8	42.8	56.4	0.01	0.00	0.00	0.00
LITTER	9.5	16.6	29.8	28.4	16.1	0.01	0.00	0.00	0.01
PRGL	13.0	5.9	7.8	10.8	15.3	0.00	0.01	0.31	0.42
ANN FORB	0.0	2.0	0.8	10.3	4.9	0.01	0.09	0.00	0.00
ANN GRAS	2.1	5.1	1.0	3.3	1.6	0.18	0.56	0.52	0.77
SPWR BAS	0.5	0.9	0.8	0.2	0.1	0.05	0.05	0.27	0.13
SPWR CAN	1.0	3.3	0.4	1.3	0.5	0.86	0.70	0.63	0.33
GUSA	3.7	3.3	0.4	1.2	4.8	0.75	0.01	0.02	0.32
PPEAR	0.1	0.4	0.6	0.6	0.2	0.37	0.15	0.15	0.56
HIMU BAS	0.2	0.0	0.1	0.1	0.0	0.17	0.56	0.56	0.17
HIMU CAN	0.3	0.3	0.4	0.3	0.3	1.00	0.77	0.75	1.00
MUPO BAS	0.0	0.0	0.1	0.2	0.2		0.34	0.05	0.17
MUPO CAN	0.4	0.4	0.3	1.6	2.6	1.00	0.66	0.07	0.01
4WING	0.1	0.4	0.5	0.9	0.2	0.37	0.36	0.15	0.66
ZIZYPHUS	0.1	0.0	0.0	0.0	0.0	0.34	0.34	0.34	0.34
CONDALIA	0.6	0.3	0.0	0.1	0.0	0.56	0.17	0.25	0.17
SEMA BAS	0.0	0.0	0.0	0.0	0.1				0.34
SEMA CAN	0.1	0.4	0.0	0.4	1.0	0.24	0.34	0.24	0.03
PAOB BAS	0.1	0.0	0.0	0.0	0.1	0.34	0.34	0.34	1.00
PAOB CAN	0.2	0.3	0.0	0.4	0.5	0.74	0.34	0.51	0.43
BOBA CAN			0.4	0.9	0.5				
ARIS CAN				0.8	0.9				
CRUXTHRN				0.9	0.0				
JHNSNGRS				0.4	0.0				
ALL BASAL	0.8	0.0	0.2	0.9	0.5	0.01	0.05	0.82	0.38
ALL CANOPY	2.0	2.3	1.9	5.8	6.3	0.69	0.89	0.01	0.00
WOODY SPP	13.9	7.0	8.9	13.3	15.7	0.00	0.02	0.78	0.55
ANNUALS	2.1	7.1	1.8	13.6	6.5	0.06	0.88	0.00	0.04

MD-4	Means					t-test P			
	1996	1999	2000	2001	2002	96-99	96-00	96-01	96-02
SOIL		49.5	43.4	36.7	58.0				
ROCK		4.6	2.7	2.9	2.9				
BARE	54.2	54.1	46.1	19.8	60.9	0.98	0.05	0.00	0.09
LITTER	16.0	12.5	22.5	20.6	7.7	0.16	0.02	0.10	0.00
ANN FORB	0.4	1.7	0.7	9.9	9.6	0.08	0.47	0.00	0.00
PRGL	16.7	20.1	25.5	22.9	24.2	0.24	0.02	0.06	0.02
ANN GRAS	2.0	1.4	0.7	0.7	0.8	0.44	0.10	0.09	0.11
GUSA	6.6	7.9	0.6	2.7	0.0	0.34	0.00	0.00	0.00
MUPO BAS	0.1	0.0	0.0	0.0	0.8	0.34	0.34	0.34	0.04
MUPO CAN	2.3	1.4	0.4	1.1	3.9	0.27	0.01	0.11	0.12
HIMU BAS	0.1	0.0	0.1	0.0	0.0	0.34	1.00	0.34	0.34
HIMU CAN	0.3	0.2	0.1	0.4	0.3	0.63	0.29	0.71	1.00
PAOB BAS	0.0	0.0	0.1	0.0	0.2		0.34		0.17
PAOB CAN	0.8	1.4	0.4	1.4	1.7	0.43	0.51	0.42	0.28
CELTIS	0.4	0.3	0.4	0.2	0.0	0.82	1.00	0.59	0.22
SPFL BAS	0.1	0.0	0.0	0.0	0.0	0.34	0.34	0.34	0.34
SPFL CAN	0.2	0.7	0.0	0.1	0.0	0.26	0.17	0.56	0.17
CONDALIA	0.4	0.2	0.0	0.1	0.0	0.59	0.22	0.37	0.22
SEMA BAS	0.0	0.0	0.5	0.2	0.4		0.14	0.17	0.04
SEMA CAN	0.6	0.8	0.9	2.1	1.8	0.56	0.50	0.00	0.04
BOCU BAS	0.1	0.0	0.0	0.0	0.0	0.34	0.34	0.34	0.34
BOCU CAN	0.5	0.1	0.0	0.6	0.0	0.06	0.01	0.78	0.01
ISTE	0.2	0.4	0.3	0.3	0.5	0.51	0.63	0.77	0.27
ZIZYPHUS	0.1	0.0	0.0	0.0	0.1	0.34	0.34	0.34	1.00
ARIS BAS	0.0	0.0	0.0	0.0	0.0				
ARIS CAN	0.3	0.5	0.0	0.0	0.7	0.69	0.34	0.34	0.26
RHMI	0.1	0.0	0.0	0.0	0.3	0.34	0.34	0.34	0.41
SOEL	0.1	0.2	0.0	0.4	0.0	0.56	0.34	0.24	0.34
4WING			0.3	0.0	0.0				
BOBA CAN				0.3	0.1				
CRUXTHRN				0.3	0.0				
ALL BASAL	0.4	0.0	0.7	0.2	1.4	0.04	0.44	0.36	0.06
ALL CANOPY	5.0	5.1	1.8	6.0	8.5	0.95	0.01	0.39	0.02
WOODY SPP	17.7	20.6	26.2	23.5	24.6	0.33	0.03	0.09	0.04
ANNUALS	2.4	3.1	1.4	10.6	10.4	0.54	0.29	0.00	0.00

MD-5, Control	Means					t-test P			
	1996	1999	2000	2001	2002	96-99	96-00	96-01	96-02
SOIL		60.3		59.9	65.8				
ROCK		4.2		4.4	2.9				
BARE	67.3	64.5		64.3	68.6	0.56		0.46	0.78
LITTER	10.8	9.9		10.5	4.3	0.57		0.90	0.00
ANN FORB	0.1	0.1		10.5	0.5	1.00		0.01	0.34
PRGL	14.5	16.8		19.3	20.6	0.40		0.10	0.12
4WING	0.4	0.6		0.4	0.3	0.40		0.94	0.62
GUSA	4.2	6.0		0.4	3.1	0.07		0.00	0.25
OPSPI	0.2	0.0		1.1	0.3	0.17		0.03	0.82
MUPO BAS	0.1	0.0		0.2	0.3	0.34		0.45	0.45
MUPO CAN	2.1	3.2		2.3	2.0	0.37		0.68	0.93
HIMU BAS	0.2	0.0		0.0	0.1	0.17		0.17	0.69
HIMU CAN	0.6	0.6		0.4	0.6	1.00		0.57	0.95
SPWR BAS	0.2	0.0		0.1	0.3	0.34		0.76	0.85
SPWR CAN	0.5	1.5		1.1	1.0	0.38		0.47	0.56
SEMA BAS	0.0	0.0		0.0	0.0				
SEMA CAN	0.1	0.3		0.0	0.0	0.41		0.34	0.34
ACOU	0.5	1.3		1.3	0.0	0.08		0.24	0.05
PAOB BAS	0.0	0.0		0.0	0.0				
PAOB CAN	0.1	0.1		0.0	0.1	1.00		0.34	0.88
BOCU BAS	0.1	0.0		0.0	0.0	0.34		0.34	0.34
BOCU CAN	0.1	0.0		0.0	0.0	0.34		0.34	0.34
ARIS CAN				0.4	0.0				
ALL BASAL	0.6	0.0		0.4	0.6	0.02		0.52	0.94
ALL CANOPY	3.5	5.7		4.0	3.8	0.19		0.73	0.89
WOODY SPP	15.1	17.4		21.1	21.1	0.41		0.06	0.12
ANNUALS	0.1	0.1		1.8	0.5	1.00		0.01	0.34

Report to the Malpai Borderlands Group:

RMRS Vegetation Manipulation Experiments, 1996-2001

Peter Sundt
Rangeland Consultant
Pima, Arizona

December 6, 2001

Report to the Malpai Borderlands Group:

RMRS Vegetation Manipulation Experiments, 1996-2001

Peter Sundt
Rangeland Consultant
Pima, Arizona

December 6, 2001

Introduction

In the fall of 1996 experimental treatment plots were established by the US Forest Service Rocky Mountain Experiment Station at 5 locations in the Malpai Borderlands region: the Ed Roos Ranch near Rodeo, New Mexico, the Glenn Ranch near Douglas, Arizona, the San Bernardino National Wildlife Refuge near Douglas, the McDonald Ranch along Cottonwood Creek in Arizona, and the George Wright pasture of the Gray Ranch, south of Animas, New Mexico. At each of these sites, with the exception of the McDonald Ranch, a rectangular grid of 12 large plots was marked, each plot being 500ft x 500ft. The entire grid was fenced to exclude cattle, and a weather station erected. The plots were sampled in 1996 before treatment to estimate canopy cover of all plant species and of bare ground and litter, and basal cover was estimated for perennial grasses. Details of the sampling methods were provided in my 1996 report to MBG. In the spring of 1999 the following treatments were applied to randomly-chosen subsets of the plots at each site (Table 1): 1) control (no treatment); 2) crushing of the vegetation with a large water-filled drum pulled behind a Cat; 3) crushing and seeding of several perennial grasses with a range drill towed behind the crusher. In 1999, 2000 and 2001 all of the plots were re-sampled, using the same methods as in 1996. The San Bernardino Refuge site was not subjected to any of the crushing or seeding treatments; however, a wildfire occurred there in 1997, and it was re-sampled in 1999, 2000 and 2001.

Table 1. Treatments by plot.

Plot number	George Wright site	Roos Ranch site	Glenn Ranch site
1	Crush + seed	Crush + seed	Control
2	Crush	Control	Crush
3	Crush	Crush + seed	Crush + seed
4	Control	Crush	Control
5	Crush + seed	Crush	Crush + seed
6	Control	Control	Control
7	Control	Crush	Crush + seed
8	Crush	Control	Crush
9	Control	Crush + seed	Crush + seed
10	Crush + seed	Crush + seed	Crush
11	Crush	Crush	Control
12	Crush + seed	Control	Crush

The McDonald Ranch site consisted of only 5 plots and was subjected to a different treatment than the other sites. In November, 1998 four of the 5 plots were fenced and hay

made from the native grass cane beardgrass (*Bothriochloa barbinodis*) was scattered on the ground. In 3 of the plots mesquites were lopped by hand and the brush scattered. Cattle were introduced for a couple of days to eat the hay, scatter the seeds and trample them into the soil. A very wet storm occurred during the treatment. The site was sampled in 1996, 1999, 2000 and 2001.

Glenn Ranch (WG)

Control plots

Control plot WG-4 showed a substantial increase in woody plant cover, mostly due to mesquite, over the time period 1996-2001, from 33% to 45%. Plot WG-6 showed a lesser increase in woody plants, while the other 2 control plots showed no significant change. In 3 of the 4 control plots the total canopy cover of perennial grasses did not change, but in WG-11 it decreased from 23% to 14%, due mostly to a loss of bush muhly. Annuals spiked in 1999 in plot WG-11, as they did in most treated plots.

Crush + seed

Plot WG-3 is a true success story: grass canopy cover went from 0.1% in 1996 to 29% in 2001, while woody cover dropped from 30% to 14%. Significant increases in grass canopy cover occurred in plots WG-7 and WG-9 also, while in WG-5 grass canopy cover did not change significantly (14% to 18%, P=0.26). Most of the increase in grass cover was due to plains bristlegrass, a species which was included in the seed mixture.

Crush only

Results from the Crush only treatment suggest that the addition of seeds was important to increase grass cover. Only in plot WG-10 did grass canopy cover increase significantly relative to pre-treatment, from 6% to 11%.

Roos Ranch (ER)

Control

All four Control plots showed significant, even dramatic, increases in perennial grass canopy cover over the period, largely due to Lehmann's lovegrass (a species not included in the seed mixture). In ER-12, cover of Lehmann's lovegrass went from 7% in 1996 to 32% in 2001! Plains bristlegrass increased significantly in all 4 Control plots also, though not as dramatically.

Crush + seed

In contrast to the Control plots, only one of the Crush + seed plots (ER-9) showed a dramatic increase in Lehmann's and plains bristlegrass canopy cover. In this same plot the cover of annuals took a dive over the study period, from 72% to 18%.

Crush only

The Crush only plots behaved much like the Control plots with dramatic increases in Lehmann's lovegrass and plains bristlegrass. In plot ER-11 Lehmann's increased from 2% to 33%. Plot ER-7 was an exception: Lehmann's fluctuated from 1% in 1996 to 8% in 2000, falling back to 1% in 2001.

George Wright (GW)

Control

Two of the Control plots at this site acted as one might expect: little change over the study period. However, plots GW-6 and GW-9 showed considerable fluctuations.

From 1996 to 1999 in plot GW-6 total grass canopy cover went from 18% to 30%, then dropped back to 22% by 2001, and in GW-9 grass rose from 12% in 1996 to 24% in 1999, where it leveled off. Most of the increased grass cover in these 2 plots was due to *Aristida* (threeawns).

Crush + seed

These plots generally showed steady increases in perennial grass canopy cover following treatment, especially in 2001. Much of the increased grass cover was species that first appeared in the record in 2001, including dropseeds, sideoats grama, plains lovegrass, Arizona cottontop, blue grama and green sprangletop.

Crush only

While these plots also showed increases in grass canopy cover, the final level was generally lower than in the Crush+seed treatments, suggesting that addition of seeds was helpful. Plot GW-2 showed a sharp increase in grass, mostly due to threeawns and Lehmann's lovegrass, the latter of which went from 0% in 1996 to 11% in 2001.

Discussion of treatment sites

Except at Rodeo, the crushing and seeding treatments apparently have been effective in increasing the cover of perennial grasses, especially plains bristlegrass. At Rodeo the background boom in Lehmann's lovegrass complicates interpretation of the results (see graphs entitled "ERLE in Rodeo plots"). Surprisingly most of the Crush+seed treatment plots at Rodeo did not show the kind of Lehmann's lovegrass increase recorded in several Crush only and Control plots, suggesting that seed addition somehow inhibited establishment of Lehmann's lovegrass. The only mechanism for such an inhibition I can imagine is competition, but the cover of seeded grass species was too low for that idea to be tenable. Lehmann's lovegrass did increase significantly (from 1% to 9%) in one Crush+seed plot (ER-9), and some of the Control and Crush only plots showed little or no increase. I think that the apparent difference among treatments is probably due to chance, i.e. assignment of the Crush+seed treatment to areas of the site which for some reason did not have much Lehmann's lovegrass seed, or for which germination conditions were poor.

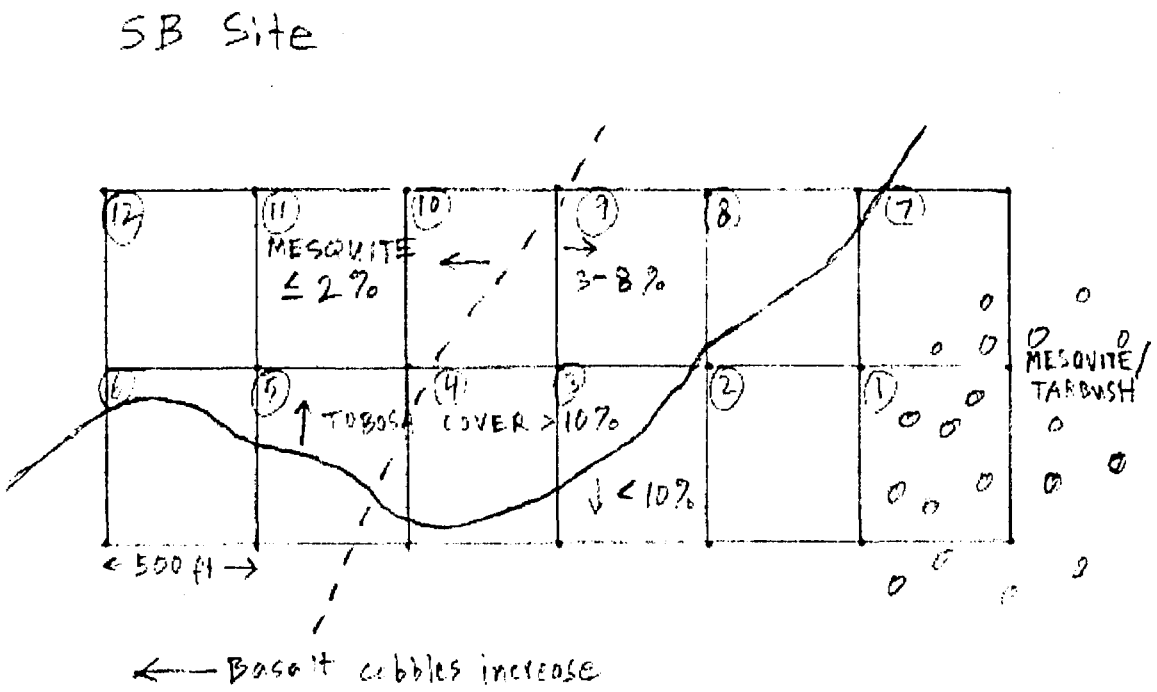
San Bernardino

The San Bernardino site had a natural wildfire in 1997 that burned most of the plots. Plot SB-1 was not burned, and plots SB-2 and SB-7 were only partly burned. The fire line coincides roughly with the line on Figure 1 showing the boundary between dense (>10%) and sparse cover of tobosa grass.

Unburned plot SB-1

A drop in grass cover and an increase in woody species cover occurred at the unburned plot SB-1. The plot cannot really serve as a control to changes that occurred in the other burned plots because its initial composition was unique. This plot is dominated by tarbush, mesquite and whitethorn with about 60% bare ground and probably did not have enough fuel to carry the 1997 wildfire (1996 cover of annuals was only 3%).

Figure 1. Plot layout at the San Bernardino site, showing areas of relatively high and low cover of tobosa (solid line) and mesquite (dashed line). Small circles in the lower right corner represent mesquite/tarbush vegetation.



Burned plots with tobosa cover <10% (SB-2, 3, 6, 7, 8)

Most of these plots showed a big drop in grass canopy cover after the 1997 fire, mostly due to loss of *Aristida*. In plot SB-3 canopy cover of *Aristida* dropped from 44% in 1996 to 10% in 1999, and continued to drop in 2000 to 3%. In SB-7 both *Aristida* and Arizona cottontop apparently suffered from the fire, dropping from 12% and 6% to 3% and <1% respectively. Annuals spiked in all these plots in 1999, dropping dramatically in 2000. Cover of whitethorn dropped significantly in plots SB-2, 3 and 8, but not in the partly-burned plot 7.

Burned plots with tobosa cover >10% (SB-4, 5, 9-12)

All of these plots showed a sharp drop in grass canopy cover between 1996 and 1999, without much recovery in later years. In most of the plots the drop was largely due to *Aristida*, while in plot SB-9 it was due to loss of vine mesquite grass (*Panicum obtusum)*. Tobosa cover did not drop significantly. In these plots annuals generally did not peak in 1999 as was the case in the plots with low tobosa cover. Whitethorn cover dropped in plots SB-4, 5, and 9.

Discussion of San Bernardino site

These results provide good evidence that threeawn grasses (*Aristida spp.*) are damaged by fire, and do not readily recover. The wildfire was probably carried by tobosa litter and dried annuals, as well as *Aristida* where it had sufficient cover. Top-kill damage was done to whitethorn, which generally had not recovered its pre-fire cover by 2001. Mesquite cover was significantly reduced in a few plots, but had recovered by 2001. Overall the effects of the 1997 wildfire could not be called beneficial, since perennial

grass canopy cover was reduced substantially, bare ground cover increased, and there was only temporary reduction in woody plant cover.

McDonald Ranch trampling experiment

This experiment would have to be judged a failure in achieving a reduction in mesquite cover and establishment of perennial grasses. In 2 of 4 treated plots the cover of woody species in 2001 was slightly higher than in the pre-treatment year of 1996, as it was in the control plot. In only one of the treatment plots did grass canopy cover increase after treatment: in plot MD-3, from 2% to 6%, due mostly to bush muhly, which was not seeded. Annuals increased in 2001 in all plots, including the control, possibly due to favorable spring rains.

Rainfall

Data from the RMRS website was compiled into monthly rainfall summaries for the Glenn, McDonald, Rodeo and George Wright weather stations (see graphs). The period of record varies, and some data is missing due to electrical malfunctions. The record for Rodeo is complete for the period June 1999 to August 2001. The summer rains in 1999 were good, about 10in in July-September. The winter of 1999-2000 was dry. The summer rains of 2000 started pretty well, with almost 2in in June, but July was dry. August of 2000 had about 4.5in, but September was extremely dry. Then a hurricane in October brought over 5in. Overall the summer of 2000 was not favorable for perennial grasses, although the October rains probably prevented a lot of drought mortality.The year 2001 at Rodeo started out well, with almost 2in of rain in January, but the rest of the winter and spring were not very wet. July rain was only 1.5in, but August was pretty good, almost 4in.

The rainfall record at Glenn Ranch is complete from January 2000 to August 2001, except for a dubious entry in July 2001 (17.51in), which has been deleted from the graph. Winter/spring moisture of 2000 was very low at Glenns, but the summer started well with 2.5in in June and over 8.5in by the end of August. As at Rodeo, September 2000 was extremely dry and the hurricane of October probably saved a lot of grasses. Another pretty dry winter/spring followed in 2000-2001. The summer rains of 2001 started with almost 3.5in in June and almost 4.5in in July, but the rains slumped in August.

The weather record at McDonald plots is complete except for 2 months: October 2000 and June 2001. Winter/spring 1999-2000 was dry at McDonalds. June 2000 was unusually wet (3in), while the rest of the summer was poor. As at all weather stations, September 2000 was extremely dry. It can be assumed that 4-5in of rain fell in October 2000 from the regional hurricane. January 2001 had almost 1.5in of rain, but the rest of the winter/spring of 2001 was not very wet, and the summer rainfall recorded through August was very low.

Electrical problems caused the loss of several important periods of data at the George Wright station, including July 20-September 2, 1999, June 1-July 15, 2000, and June 4-August 5, 2001. From the records that remain it can be seen that rainfall at George Wright was consistent with the regional pattern of a dry winter/spring 1999-2000. As at

the other stations September 2000 was extremely dry. The October 2000 hurricane brought considerably less rain to George Wright than elsewhere (less than 3in), followed by about 1.5in in November. Another pretty wet January was followed by a generally dry winter/spring 2001. Much of the summer rain record was lost, but only 1in in August is pretty bad.

In view of the mediocre summer rains of 2000 and 2001 the increase of perennial grass cover in many of the study plots, including Control plots, is encouraging.

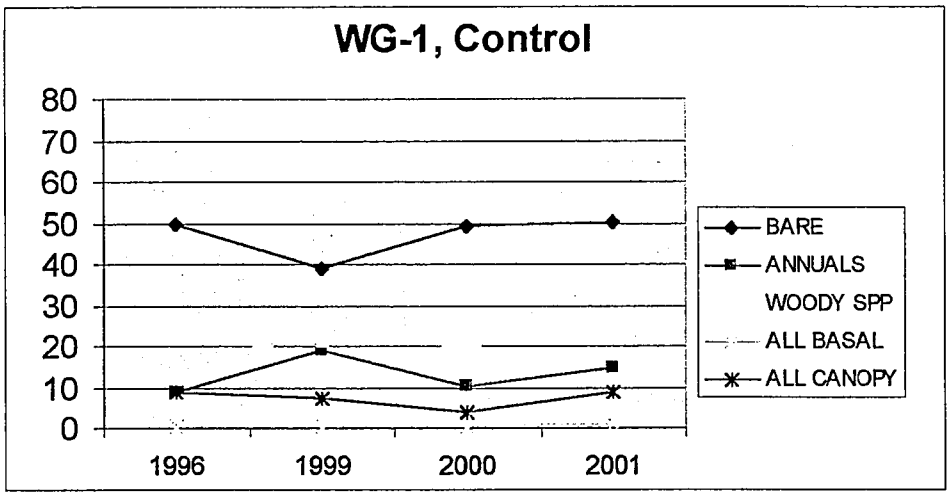
Interpreting graphs and tables

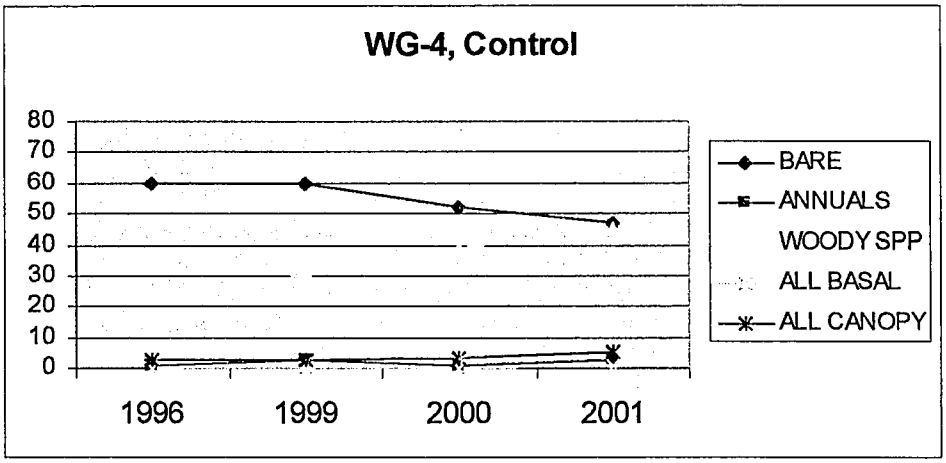
The summary tables for each plot present the average cover values of all species, with t-test P values. T-test P is the probability that the 2 sample means being compared are actually the same, any apparent difference being due to random factors rather than any true change in cover. For example, the t-test P = 0.09 for the comparison of Bare cover in plot ER-1 between 1996 and 1999, in which years the Bare cover values were 63.1 and 55.7. There is a 9% chance that the apparent difference of 7.4 percentage points was due to random variation, not real change. I generally accept that a real change has occurred whenever P<0.20, but other readers may prefer more confidence.

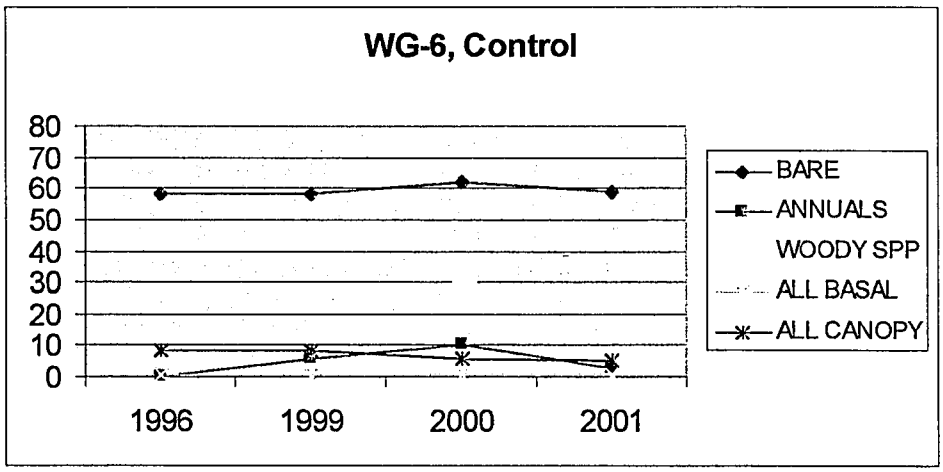
In the graphs several species have been lumped into functional groups to clarify and simplify the analyses. The functional groups are "All Basal", the summed basal covers of all perennial grasses, "All Canopy", the summed canopy covers of all perennial grasses, "Woody Spp", the summed covers of all woody species (including mesquite, whitethorn, tarbush, etc., but not including low shrubs like snakeweed, burroweed or *Ephedra*), and "Annuals", the summed covers of annual forbs and grasses. The graphs are arranged such that plots that received the same treatment are on the same page.

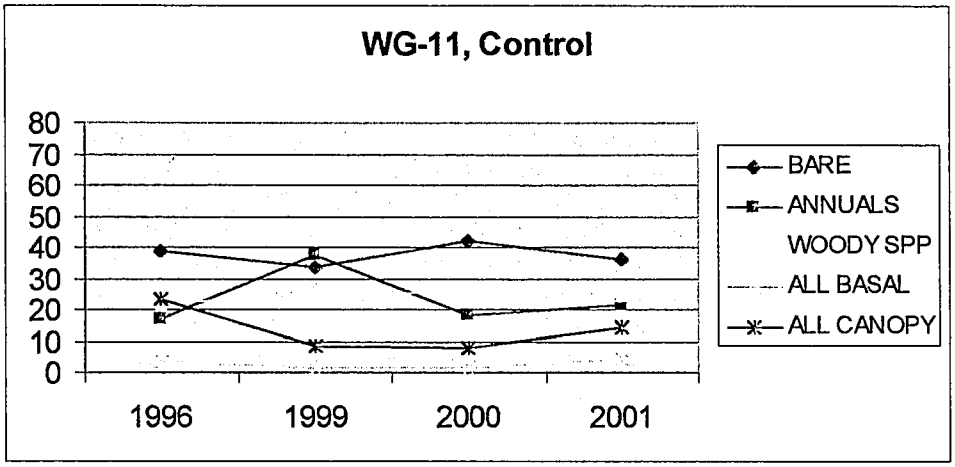
Acknowledgements

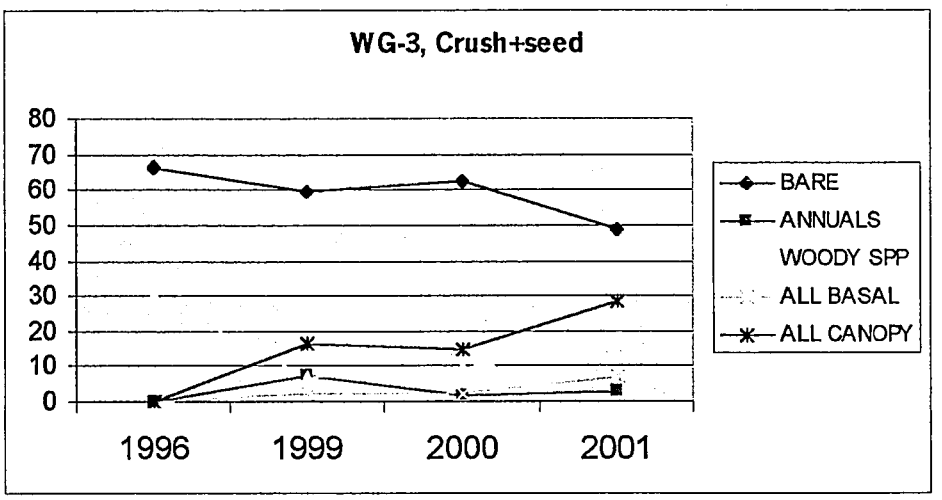
Fieldwork in 2001 was accomplished by a crew directed and organized by Jan Fox Holl, and consisting of Bill Wheelan, Matt Yarrow and Piper Weisenheimer. Pete Sundt provided field assistance, ensured consistency with previous years' procedures, and analyzed and interpreted the data.

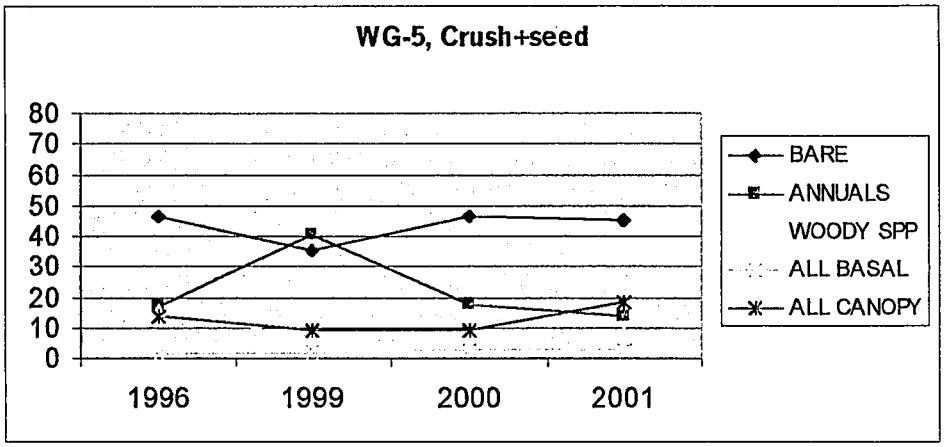

WG-1, Control
80
70
60
50
40
30
20
10
0
1996
1999
2000
2001
BARE
ANNUALS
WOODY SPP
ALL BASAL
ALL CANOPY

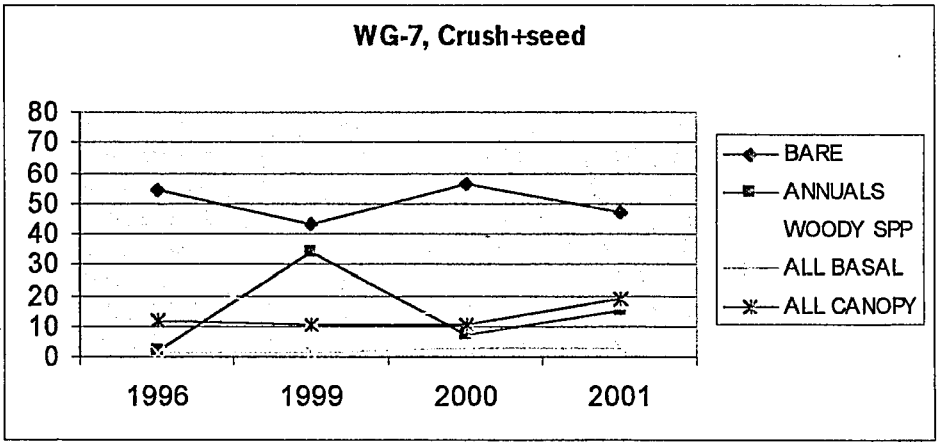

WG-4, Control
80
70
60
50
40
30
20
10
0
1996
1999
2000
2001
BARE
ANNUALS
WOODY SPP
ALL BASAL
ALL CANOPY

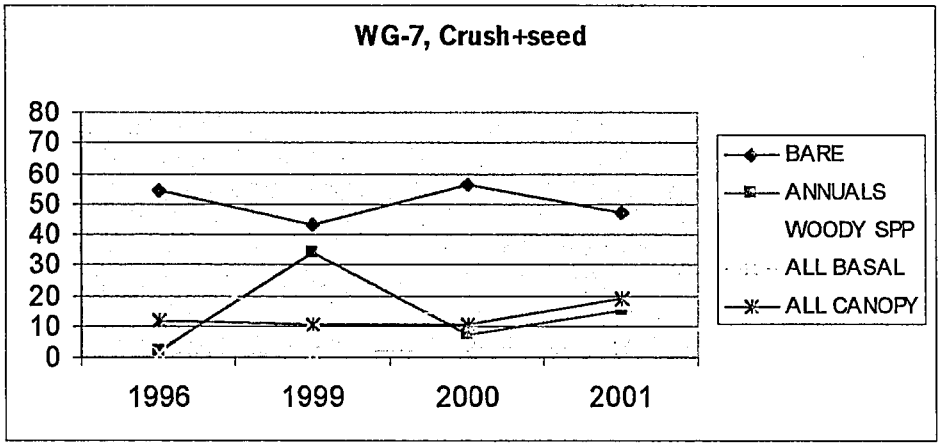

WG-6, Control
80
70
60
50
40
30
20
10
0
1996
1999
2000
2001
BARE
ANNUALS
WOODY SPP
ALL BASAL
ALL CANOPY

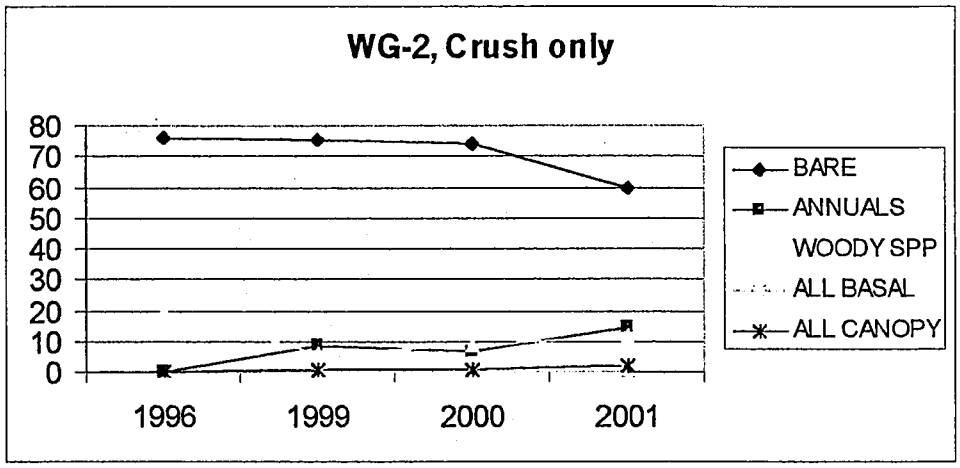

WG-11, Control
80
70
60
50
40
30
20
10
0
1996
1999
2000
2001
BARE
ANNUALS
WOODY SPP
ALL BASAL
ALL CANOPY

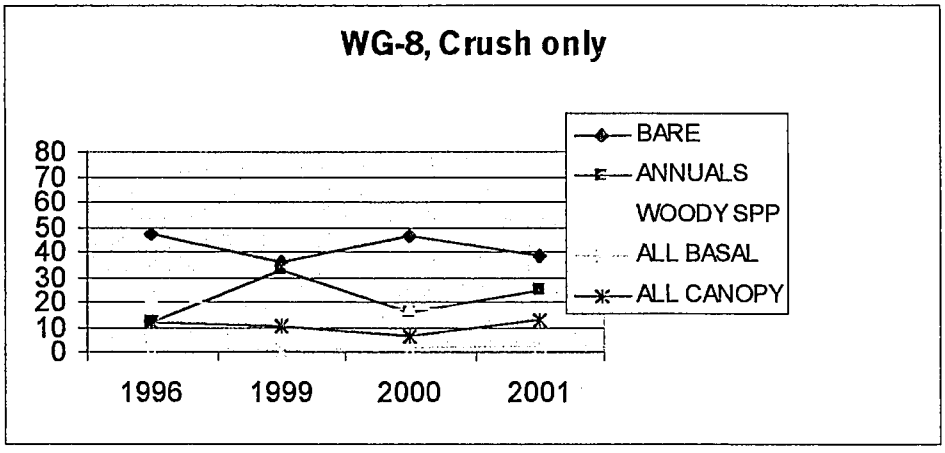

WG-3, Crush+seed
80
70
60
50
40
30
20
10
0
1996
1999
2000
2001
BARE
ANNUALS
WOODY SPP
ALL BASAL
ALL CANOPY

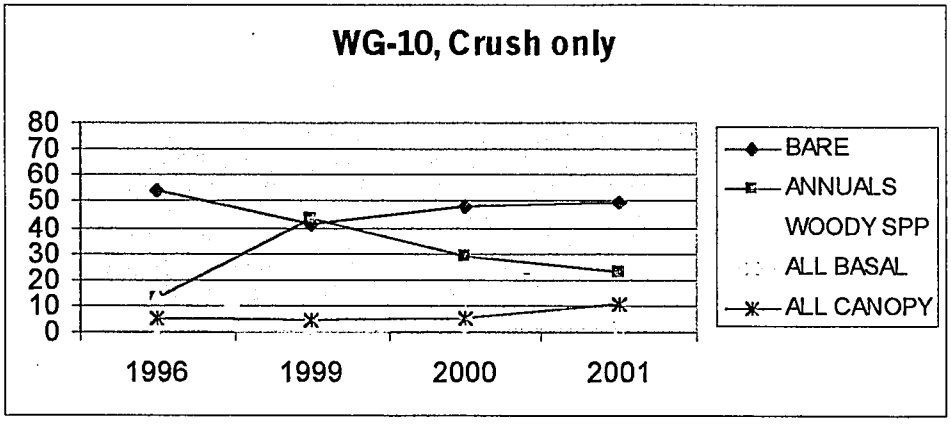

WG-5, Crush+seed
80
70
60
50
40
30
20
10
0
1996
1999
2000
2001
BARE
ANNUALS
WOODY SPP
ALL BASAL
ALL CANOPY


WG-7, Crush+seed
80
70
60
50
40
30
20
10
0
1996
1999
2000
2001
BARE
ANNUALS
WOODY SPP
ALL BASAL
ALL CANOPY


WG-7, Crush+seed
80
70
60
50
40
30
20
10
0
1996
1999
2000
2001
BARE
ANNUALS
WOODY SPP
ALL BASAL
ALL CANOPY


WG-2, Crush only
80
70
60
50
40
30
20
10
0
1996
1999
2000
2001
BARE
ANNUALS
WOODY SPP
ALL BASAL
ALL CANOPY


WG-8, Crush only
80
70
60
50
40
30
20
10
0
1996
1999
2000
2001
BARE
ANNUALS
WOODY SPP
ALL BASAL
ALL CANOPY


WG-10, Crush only
80
70
60
50
40
30
20
10
0
1996
1999
2000
2001
BARE
ANNUALS
WOODY SPP
ALL BASAL
ALL CANOPY

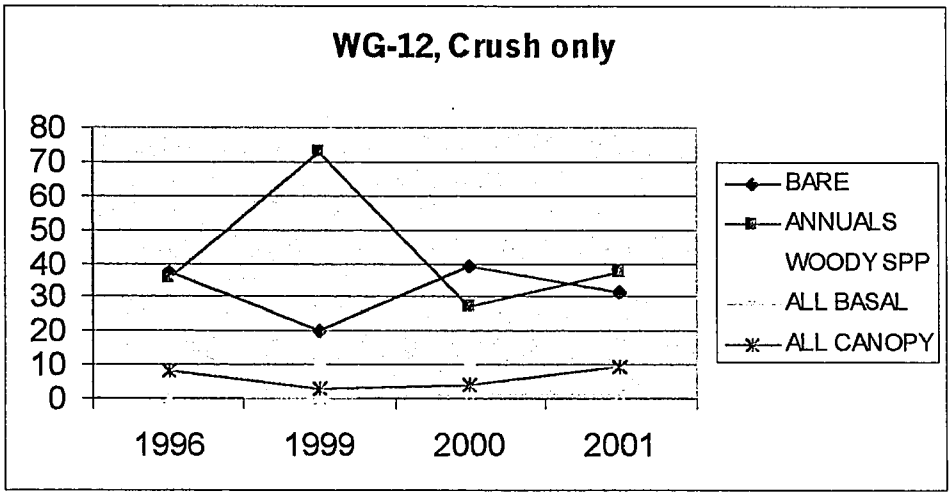

WG-12, Crush only
80
70
60
50
40
30
20
10
0
1996
1999
2000
2001
BARE
ANNUALS
WOODY SPP
ALL BASAL
ALL CANOPY

Table 2. Comparison of cover data, 1996-2001, Glenn Ranch site.

WG-1, Control	Means				t-test P		
	1996	1999	2000	2001	96-99	96-00	96-01
SOIL		36.5	41.1	45.5			
ROCK		2.4	8.4	4.7			
BARE	49.6	38.9	49.5	50.2	0.01	0.98	0.86
LITTER	11.6	7.0	17.1	11.3	0.06	0.08	0.89
FORB	1.5	12.5	1.7	12.3	0.00	0.79	0.00
ANN GRASS	7.5	6.4	8.5	2.4	0.69	0.79	0.06
WHITETHORN	10.9	10.4	11.8	11.2	0.86	0.65	0.92
PRGL	7.0	11.3	8.0	11.1	0.17	0.68	0.20
GUSA	6.2	13.6	0.6	2.3	0.00	0.00	0.01
SOEL	0.6	0.6	0.0	0.0	0.95	0.02	0.02
ARIS BAS	0.4	0.0	0.2	0.1	0.17	0.56	0.31
ARIS CAN	6.0	0.9	0.6	2.2	0.00	0.00	0.01
HIMU BAS	0.2	0.0	0.1	0.3	0.17	0.56	0.63
HIMU CAN	1.2	0.9	0.8	2.7	0.70	0.53	0.25
MUPO BAS	0.1	0.6	0.2	0.5	0.16	0.56	0.13
MUPO CAN	1.7	4.0	2.2	2.1	0.14	0.64	0.69
SEMA BAS	0.0	0.0	0.0	0.3			0.19
SEMA CAN	0.1	1.6	0.3	1.7	0.06	0.54	0.09
PPEAR	0.1	0	0	0	0.34	0.34	0.34
YUEL	0.2	0.0	0.0	0.0	0.34	0.34	0.34
MIBI	0.1	0.0	0.0	0.0	0.34	0.34	0.34
TARBUSH		1.4	1.0	0.9			
HODE				0.8			
ALL BASAL	0.7	0.6	0.5	1.2	0.70	0.68	0.34
ALL CANOPY	9.0	7.4	3.9	8.7	0.26	0.01	0.89
WOODY SPP	0.4	0.6	0.3	1.1	0.96	0.22	0.10
ANNUALS	3.2	6.5	3.3	6.5	0.13	0.76	0.13
ALL BASAL	0.0	0.0	0.1	0.3		0.33	0.41
ALL CANOPY	0.0	0.8	0.7	1.9	0.04	0.81	0.08

Table 2. Comparison of cover data, 1996-2001, Glenn Ranch site.

WG-2, Crush only	Means				t-test P		
	1996	1999	2000	2001	96-99	96-00	96-01
SOIL		70.2	69.5	55.9			
ROCK		5.5	4.3	4.3			
BARE	75.8	75.7	73.8	60.0	0.97	0.51	0.00
LITTER	4.0	8.2	11.7	11.9	0.02	0.00	0.00
FORB	0.0	7.3	4.7	13.6	0.00	0.00	0.00
ANN GRASS	0.0	1.5	1.7	0.7	0.11	0.01	0.02
PRGL	13.0	4.9	6.9	9.1	0.00	0.00	0.05
GUSA	0.0	0.1	0.2	1.1	0.34	0.34	0.15
TARBUSH	6.5	1.2	1.8	2.5	0.00	0.00	0.00
4WING	0.3	0.0	0.0	0.1	0.08	0.08	0.29
MUPO BAS	0.0	0.0	0.0	0.0			
MUPO CAN	0.0	0.0	0.1	0.0		0.34	
ACOU	0.2	0.1	0.1	0.2	0.56	0.56	1.00
SEMA BAS		0.0	0.1	0.3			
SEMA CAN		0.8	0.6	1.9			
HODE				0.3			
SOEL				0.4			
ALL BASAL	0.0	0.0	0.1	0.3		0.34	0.19
ALL CANOPY	0.0	0.8	0.7	1.9	0.05	0.01	0.01
WOODY SPP	19.8	6.1	8.7	11.7	0.00	0.00	0.00
ANNUALS	0.0	8.8	6.4	14.3	0.00	0.00	0.00

WG-3, Crush+seed	Means				t-test P		
	1996	1999	2000	2001	96-99	96-00	96-01
SOIL		51.5	53.8	43.1			
ROCK		8.2	8.7	5.7			
BARE	66.3	59.7	62.5	48.8	0.01	0.20	0.00
LITTER	4.7	8.5	11.5	9.1	0.00	0.00	0.00
FORB	0.0	7.4	1.8	2.9	0.00	0.00	0.02
ANN GRASS	0.0	1.2	1.0	0.3	0.01	0.01	0.08
PRGL	17.8	4.2	7.1	10.4	0.00	0.00	0.00
TARBUSH	12.2	2.8	2.6	3.1	0.00	0.00	0.00
SEMA BAS	0.0	2.0	2.5	6.8	0.00	0.00	0.00
SEMA CAN	0.1	16.7	14.9	27.7	0.00	0.00	0.00
GUSA	0.3	0.2	0.0	0.0	0.74	0.19	0.19
HIMU CAN			1.0	1.4			
BOCU BAS				0.1			
BOCU CAN				0.7			
BOGR BAS				0.1			
BOGR CAN				0.2			
ALL BASAL	0.0	2.0	2.5	7.0	0.00	0.00	0.00
ALL CANOPY	0.1	16.7	14.9	28.6	0.00	0.00	0.00
WOODY SPP	30.0	7.0	9.7	13.5	0.00	0.00	0.00
ANNUALS	0.0	8.6	2.8	3.2	0.00	0.00	0.02

WG-4, Control	Means				t-test P		
	1996	1999	2000	2001	96-99	96-00	96-01
SOIL		49.6	42.4	39.8			
ROCK		10.4	9.9	7.0			
BARE	59.6	60.0	52.3	46.8	0.91	0.11	0.00
LITTER	6.9	5.6	6.8	6.1	0.31	0.95	0.53
FORB	0.6	2.4	0.9	2.8	0.25	0.58	0.06
ANN GRASS	0.0	0.1	0.5	0.0	0.35	0.10	
WHITETHORN	0.3	1.3	2.6	2.5	0.43	0.04	0.03
PRGL	19.8	14.3	23.7	29.3	0.01	0.04	0.00
TARBUSH	13.0	14.6	12.9	13.3	0.41	0.96	0.88
GUSA	1.4	2.5	0.1	0.9	0.29	0.05	0.43
MUPO BAS	0.3	0.3	0.1	0.7	0.85	0.41	0.47
MUPO CAN	1.4	1.5	2.0	3.1	0.89	0.46	0.12
HIMU BAS	0.0	0.0	0.0	0.0			
HIMU CAN	0.1	0.0	0.2	0.4	0.34	0.66	0.31
ARIS BAS	0.0	0.0	0.0	0.2			0.34
ARIS CAN	0.6	1.0	0.3	0.6	0.68	0.56	1.00
BOER BAS	0.0	0.0	0.0	0.0			
BOER CAN	0.2	0.0	0.0	0.1	0.17	0.17	0.56
DICA BAS	0.0	0.0	0.0	0.0			
DICA CAN	0.2	0.0	0.0	0.1	0.34	0.34	0.66
LARREA	0.1	0.0	0.2	0.2	0.34	0.66	0.66
SEMA BAS	0.0	0.1	0.2	0.0	0.35	0.17	
SEMA CAN	0.1	1.1	0.9	0.8	0.16	0.07	0.13
SALTBUSH				0.6			
ALL BASAL	0.3	0.3	0.3	0.9	1.00	1.00	0.33
ALL CANOPY	2.6	2.9	3.4	5.1	0.85	0.55	0.20
WOODY SPP	33.2	24.1	39.4	45.3	0.08	0.08	0.01
ANNUALS	0.6	2.0	1.4	2.8	0.28	0.25	0.06

WG-5, Crush+seed	Means				t-test P		
	1996	1999	2000	2001	96-99	96-00	96-01
SOIL		31.2	38.9	39.2			
ROCK		4.2	7.5	5.7			
BARE	46.3	35.4	46.4	45.0	0.02	0.98	0.78
LITTER	9.7	5.5	22.1	15.9	0.01	0.00	0.00
FORB	2.2	18.3	0.8	11.8	0.00	0.10	0.00
ANN GRASS	14.7	22.1	16.6	2.1	0.05	0.51	0.00
WHITETHORN	11.6	5.8	6.3	7.1	0.00	0.00	0.04
PRGL	2.5	0.3	0.9	1.1	0.00	0.03	0.06
TARBUSH	1.4	0.5	0.4	0.0	0.26	0.20	0.08
GUSA	3.8	7.2	0.6	1.5	0.00	0.00	0.02
MUPO BAS	0.0	0.0	0.2	0.2		0.34	0.17
MUPO CAN	1.1	0.5	1.3	0.8	0.33	0.82	0.62
HIMU BAS	1.4	1.7	2.1	1.1	0.85	0.64	0.67
HIMU CAN	7.3	1.0	4.9	5.5	0.05	0.53	0.64
ARIS BAS	0.0	0.0	0.0	0.1			0.34
ARIS CAN	4.9	1.0	0.2	2.2	0.01	0.00	0.05
PAOB BAS	0.0	0.0	0.0	0.0			
PAOB CAN	0.3	0.1	0.0	0.2	0.41	0.19	0.70
YUEL	0.4	0.0	0.1	0.1	0.10	0.24	0.24
HODE	0.3	0.5	0.0	0.9	0.57	0.19	0.10
ISTE	0.1	0.2	0.0	0.0	0.66	0.34	0.34
SEMA BAS		0.4	0.3	1.0			
SEMA CAN		6.8	2.7	6.9			
BORO BAS				0.0			
BORO CAN				2.5			
ALL BASAL	1.4	2.1	2.6	2.4	0.65	0.44	0.17
ALL CANOPY	13.6	9.4	9.1	18.1	0.20	0.22	0.26
WOODY SPP	15.9	6.6	7.7	8.3	0.00	0.00	0.00
ANNUALS	16.9	40.4	17.4	13.9	0.00	0.89	0.38

Table 2. Comparison of cover data, 1996-2001, Glenn Ranch site.

WG-6, Control	Means				t-test P		
	1996	1999	2000	2001	96-99	96-00	96-01
SOIL		50.4	53.8	53.6			
ROCK		7.6	8.4	5.5			
BARE	58.0	58.0	62.1	59.0	1.00	0.59	0.79
LITTER	7.2	5.3	6.1	6.0	0.06	0.67	0.28
ANN GRASS	0.1	3.8	10.3	0.0	0.10	0.31	0.34
WHITETHORN	3.3	3.0	2.6	3.3	0.81	0.95	1.00
PRGL	13.7	11.6	15.1	18.2	0.40	0.49	0.20
TARBUSH	9.9	11.1	12.3	11.5	0.51	0.62	0.53
GUSA	5.0	2.3	0.1	0.5	0.01	0.00	0.00
MUPO BAS	0.3	0.8	1.0	0.1	0.15	0.15	0.29
MUPO CAN	6.2	6.8	4.8	3.2	0.66	0.38	0.01
HIMU BAS	0.2	0.3	0.0	0.4	0.88	0.34	0.59
HIMU CAN	0.4	1.9	0.0	1.1	0.29	0.66	0.46
ARIS BAS	0.0	0.0	0.0	0.0			
ARIS CAN	0.7	0.4	0.0	0.3	0.58	0.21	0.49
SEMA BAS	0.0	0.1	0.0	0.0	0.35	0.34	
SEMA CAN	0.5	1.0	0.3	0.4	0.23	0.47	0.75
4WING	0.7	0.3	0.1	0.6	0.34	0.20	0.86
SPWR BAS	0.0	0.0	0.0	0.0			
SPWR CAN	0.2	0.0	0.0	0.0	0.34	0.34	0.34
PAOB BAS	0.0	0.0	0.0	0.0			
PAOB CAN	0.3	0.8	0.1	0.0	0.42	0.41	0.19
ACOUTRIA	0.1	0.5	0.3	0.0	0.09	0.56	0.34
ANN FORB		2.1	0.1	2.4			
ALL BASAL	0.5	0.9	0.9	0.5	0.35	0.35	1.00
ALL CANOPY	8.3	8.6	5.6	5.0	0.91	0.24	0.15
WOODY SPP	27.6	20.8	29.8	33.6	0.11	0.58	0.13
ANNUALS	0.1	4.7	8.9	2.4	0.04	0.29	0.03

Table 2. Comparison of cover data, 1996-2001, Glenn Ranch site.

WG-7, Crush+seed	Means				t-test P		
	1996	1999	2000	2001	96-99	96-00	96-01
SOIL		35.2	46.2	38.9			
ROCK		7.9	10.0	8.3			
BARE	54.5	43.1	56.2	47.2	0.05	0.73	0.16
LITTER	7.1	9.2	14.3	10.8	0.22	0.00	0.07
ANN FORB	1.2	25.6	4.1	14.8	0.00	0.04	0.00
ANN GRASS	0.9	8.3	2.9	0.4	0.00	0.12	0.24
WHITETHORN	9.1	5.5	6.1	7.0	0.01	0.02	0.10
PRGL	13.1	5.4	6.5	9.5	0.00	0.00	0.07
TARBUSH	5.6	1.2	2.4	0.9	0.00	0.03	0.00
GUSA	4.2	1.6	0.3	1.3	0.04	0.00	0.02
MUPO BAS	0.7	0.3	0.1	0.2	0.21	0.05	0.11
MUPO CAN	7.1	1.7	1.0	1.7	0.00	0.00	0.00
HIMU BAS	0.4	0.2	0.6	0.5	0.51	0.67	0.79
HIMU CAN	3.5	1.2	1.8	2.4	0.35	0.50	0.67
ARIS BAS	0.0	0.0	0.0	0.1			0.34
ARIS CAN	0.1	0.3	0.3	0.2	0.54	0.29	0.66
SEMA BAS	0.0	0.8	1.6	1.8	0.00	0.02	0.00
SEMA CAN	0.5	6.7	7.2	13.0	0.00	0.00	0.00
4WING	0.1	0.0	0.1	0.0	0.34	1.00	0.34
PAOB BAS	0.1	0.0	0.0	0.1	0.34	0.34	1.00
PAOB CAN	0.2	0.3	0.0	1.4	0.74	0.34	0.24
DICA BAS	0.0	0.0	0.0	0.0			
DICA CAN	0.5	0.0	0.0	0.1	0.05	0.05	0.13
OPSPI	0.1	0.0	0.0	0.0	0.34	0.34	0.34
SOEL	0.1	0.3	0.0	0.1	0.29	0.34	1.00
BOER BAS				0.0			
BOER CAN				0.1			
BOCU BAS				0.0			
BOCU CAN				0.4			
ALL BASAL	1.2	1.3	2.3	2.7	0.86	0.18	0.03
ALL CANOPY	11.9	10.2	10.3	19.3	0.69	0.68	0.09
WOODY SPP	28.0	12.1	15.1	17.4	0.00	0.00	0.00
ANNUALS	2.1	33.9	7.0	15.2	0.00	0.03	0.00

WG-8, Crush only	Means				t-test P		
	1996	1999	2000	2001	96-99	96-00	96-01
SOIL		26.6	34.4	27.2			
ROCK		9.2	12.2	11.0			
BARE	47.0	35.8	46.6	38.2	0.03	0.93	0.06
LITTER	8.4	5.5	15.4	14.3	0.06	0.00	0.01
ANN FORB	6.7	26.4	8.3	22.3	0.00	0.57	0.00
PRGL	8.1	5.1	6.2	4.4	0.12	0.38	0.07
ANN GRAS	5.6	6.6	7.5	2.2	0.64	0.41	0.07
TARBUSH	0.2	0.3	0.1	0.2	0.74	0.66	1.00
GUSA	3.5	11.4	0.6	3.0	0.00	0.00	0.59
MUPO BAS	0.2	0.1	0.1	0.0	0.56	0.56	0.17
MUPO CAN	5.1	2.3	0.7	0.2	0.11	0.01	0.01
WHITETHORN	14.0	11.2	11.8	11.3	0.20	0.30	0.16
DICA BAS	0.4	0.0	0.0	0.0	0.04	0.04	0.04
DICA CAN	0.7	0.1	0.0	0.5	0.12	0.07	0.63
ARIS BAS	0.1	0.1	0.0	0.6	1.00	0.34	0.19
ARIS CAN	2.1	2.6	1.8	4.8	0.54	0.64	0.08
SEMA BAS	0.1	0.0	0.0	0.1	0.34	0.34	1.00
SEMA CAN	0.3	0.3	0.4	0.5	1.00	0.77	0.57
SOEL	0.1	0.4	0.1	0.1	0.24	1.00	1.00
HIMU BAS	0.3	0.4	0.3	0.7	0.75	1.00	0.49
HIMU CAN	2.5	3.1	1.4	2.2	0.64	0.25	0.82
CRCO	0.7	0.9	0.0	0.5	0.71	0.11	0.67
PAOB BAS	0.0	0.0	0.3	0.1		0.19	0.34
PAOB CAN	0.5	0.4	0.3	0.6	0.79	0.53	0.83
BOFI BAS	0.2	0.0	0.3	0.0	0.34	0.70	0.34
BOFI CAN	0.8	1.7	0.8	0.0	0.39	1.00	0.14
OPSPI	0.2	0.0	0.0	0.0	0.17	0.17	0.17
BOER BAS	0.0	0.0	0.0	0.0			
BOER CAN	0.2	0.0	0.0	0.1	0.34	0.34	0.66
BORO BAS			0.7	0.8			
BORO CAN			0.9	4.1			
BOGR CAN			0.2	0.2			
BOCU CAN				0.1			
ALL BASAL	1.3	0.6	1.7	2.3	0.12	0.64	0.16
ALL CANOPY	12.2	10.5	6.3	13.0	0.46	0.02	0.79
WOODY SPP	22.5	16.6	18.1	15.9	0.10	0.25	0.05
ANNUALS	12.3	33.0	15.8	24.5	0.00	0.46	0.01

Table 2. Comparison of cover data, 1996-2001, Glenn Ranch site.

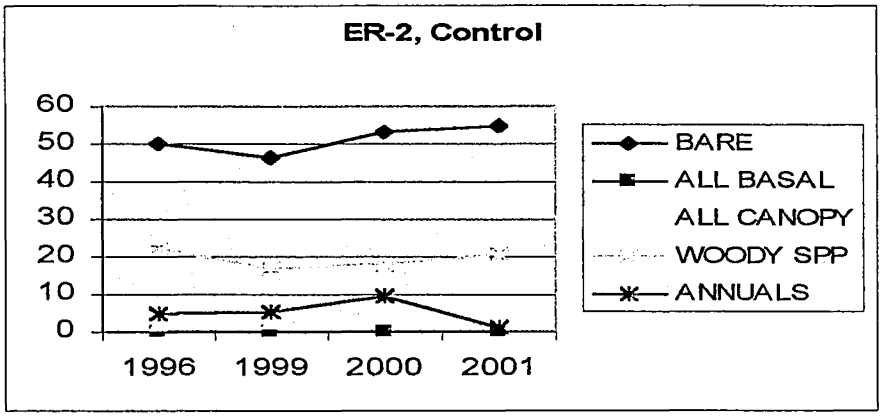
WG-9, Crush+seed	Means				t-test P		
	1996	1999	2000	2001	96-99	96-00	96-01
SOIL		42.1	51.5	53.8			
ROCK		6.3	8.1	7.2			
BARE	61.3	48.4	59.6	61.0	0.01	0.79	0.95
LITTER	9.6	6.0	16.8	11.6	0.07	0.00	0.36
FORB	1.8	17.8	0.5	7.1	0.00	0.03	0.00
PRGL	0.2	0.1	0.2	0.2	0.56	1.00	1.00
ANN GRAS	7.9	14.4	17.9	2.2	0.03	0.06	0.03
WHITETH	11.0	4.7	3.1	5.1	0.01	0.00	0.01
HIMU BAS	0.0	0.0	0.0	0.0			
HIMU CAN	0.8	0.2	0.0	0.3	0.33	0.18	0.40
GUSA	3.3	5.9	0.4	4.2	0.04	0.00	0.48
ARIS BAS	0.1	0.0	0.0	0.0	0.34	0.34	0.34
ARIS CAN	0.3	0.3	0.0	0.9	1.00	0.19	0.16
DAPU BAS	0.3	0.0	0.0	0.0	0.19	0.19	0.19
DAPU CAN	0.8	0.0	0.0	0.1	0.04	0.04	0.07
ZINNIA	0.9	0.0	0.0	0.1	0.01	0.01	0.02
TARBUSH	1.9	0.0	0.0	0.2	0.02	0.02	0.03
LARREA	0.5	0.0	0.0	0.1	0.14	0.14	0.24
HODE	0.1	0.7	0.0	0.5	0.05	0.34	0.13
SEMA BAS			0.2	0.9			
SEMA CAN			1.9	6.3			
MUPO BAS				0.2			
MUPO CAN				0.6			
ALL BASAL	0.4	0.0	0.2	1.1	0.10	0.45	0.24
ALL CANOPY	1.9	0.5	1.9	8.2	0.05	1.00	0.03
WOODY SPP	13.6	4.8	3.3	5.6	0.00	0.00	0.00
ANNUALS	9.7	32.2	18.4	9.3	0.00	0.09	0.89

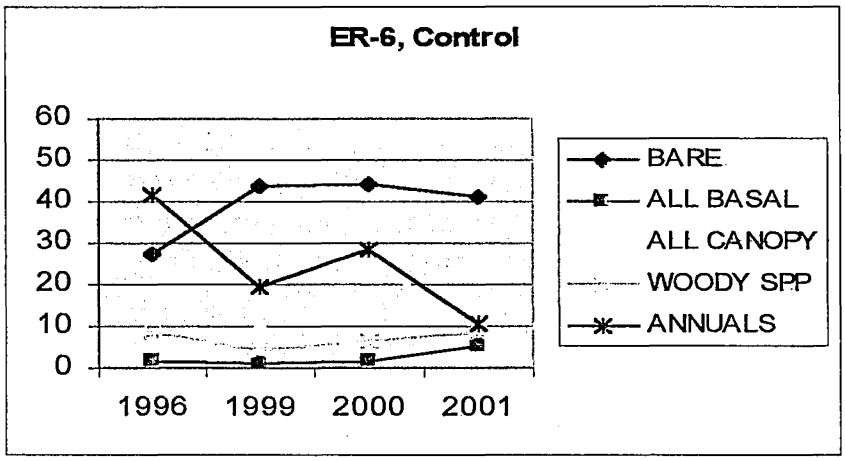
WG-10, Crush only	Means				t-test P		
	1996	1999	2000	2001	96-99	96-00	96-01
SOIL		39.0	45.2	46.9			
ROCK		2.0	2.8	2.3			
BARE	53.9	41.0	47.7	49.2	0.03	0.27	0.37
LITTER	9.1	6.8	14.3	10.0	0.07	0.04	0.58
FORB	2.1	17.9	1.1	22.4	0.00	0.29	0.00
PRGL	1.4	0.7	1.2	1.7	0.23	0.72	0.68
ANN GRAS	11.2	25.4	27.7	0.5	0.02	0.00	0.00
WHITETH	12.3	5.6	6.3	6.2	0.02	0.03	0.03
HIMU BAS	0.1	0.1	0.4	0.6	1.00	0.37	0.15
HIMU CAN	0.9	0.2	1.8	1.9	0.13	0.37	0.39
GUSA	4.1	4.0	0.5	2.1	0.95	0.00	0.10
MUPO BAS	0.0	0.0	0.0	0.2			0.17
MUPO CAN	0.2	0.7	0.4	0.6	0.23	0.45	0.39
ARIS BAS	0.3	0.1	0.0	0.3	0.29	0.08	1.00
ARIS CAN	3.8	2.9	2.4	5.5	0.52	0.22	0.36
MIBI	0.1	0.0	0.0	0.0	0.34	0.34	0.34
PAOB BAS	0.0	0.1	0.0	0.3	0.34		0.19
PAOB CAN	0.4	0.5	0.2	0.9	0.85	0.66	0.50
TARBUSH	0.4	0.1	0.1	0.0	0.24	0.24	0.10
SEMA BAS	0.0	0.0	0.1	0.0		0.34	
SEMA CAN	0.2	0.2	0.2	0.9	1.00	1.00	0.11
ERLE BAS	0.0	0.0	0.0	0.0			
ERLE CAN	0.1	0.0	0.0	0.1	0.34	0.34	1.00
HODE				0.2			
BORO BAS				0.0			
BORO CAN				0.9			
ALL BASAL	0.4	0.3	0.5	1.4	0.75	0.79	0.07
ALL CANOPY	5.6	4.5	5.0	10.8	0.54	0.70	0.05
WOODY SPP	14.2	6.4	7.6	7.9	0.01	0.02	0.03
ANNUALS	13.3	43.3	28.8	22.9	0.00	0.01	0.01

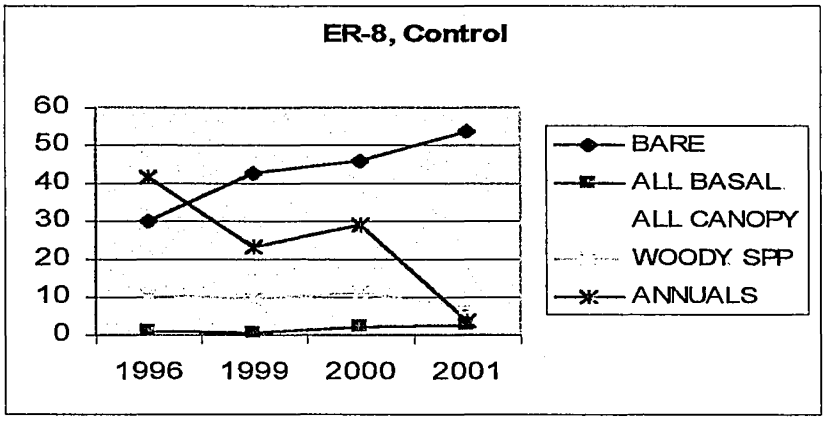
WG-11, Control	Means				t-test P		
	1996	1999	2000	2001	96-99	96-00	96-01
SOIL		28.8	35.5	31.0			
ROCK		5.0	6.4	5.4			
BARE	39.0	33.8	41.9	36.4	0.34	0.67	0.64
LITTER	9.0	3.9	13.1	13.9	0.01	0.08	0.02
FORB	6.2	22.8	5.8	20.7	0.00	0.83	0.00
PRGL	7.5	7.1	7.1	5.4	0.83	0.83	0.26
ANN GRASS	10.4	14.5	12.5	0.7	0.41	0.68	0.01
WHITETHORN	14.1	18.4	17.9	18.9	0.14	0.21	0.04
GUSA	1.9	6.5	0.0	0.9	0.05	0.01	0.18
ARIS BAS	0.0	0.1	0.0	0.0	0.35		
ARIS CAN	2.8	0.3	0.4	0.5	0.06	0.07	0.09
MUPO BAS	0.5	0.5	0.0	0.0	1.00	0.05	0.05
MUPO CAN	4.2	3.4	0.6	0.6	0.50	0.00	0.00
HIMU BAS	1.7	0.9	1.6	2.3	0.31	0.92	0.62
HIMU CAN	10.5	6.0	6.0	9.7	0.19	0.25	0.83
SEMA BAS	0.0	0.0	0.0	0.0			
SEMA CAN	0.6	0.0	0.1	0.2	0.05	0.11	0.25
PAOB BAS	0.8	0.5	0.0	1.4	0.64	0.15	0.53
PAOB CAN	3.3	1.1	0.3	3.2	0.10	0.02	0.96
BOCU BAS	0.0	0.0	0.0	0.0			
BOCU CAN	0.1	0.0	0.0	0.1	0.34	0.34	1.00
DICA BAS	0.0	0.0	0.0	0.0			
DICA CAN	1.6	0.0	0.1	0.0	0.00	0.01	0.00
LARREA	0.1	0.0	0.0	0.0	0.34	0.34	0.34
P PEAR	0.1	0.0	0.0	0.1	0.34	0.34	1.00
TARBUSH	0.2	1.0	1.6	0.8	0.06	0.01	0.11
SOEL				0.1			
ALL BASAL	3.0	1.6	1.6	3.7	0.18	0.25	0.69
ALL CANOPY	23.1	8.6	7.5	14.3	0.00	0.00	0.06
WOODY SPP	21.9	21.2	26.6	25.1	0.88	0.24	0.30
ANNUALS	16.6	29.8	18.3	21.4	0.08	0.78	0.32

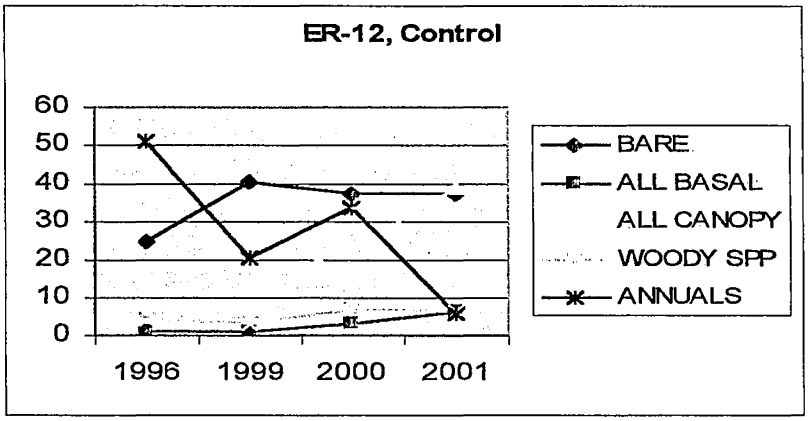
Table 2. Comparison of cover data, 1996-2001, Glenn Ranch site.

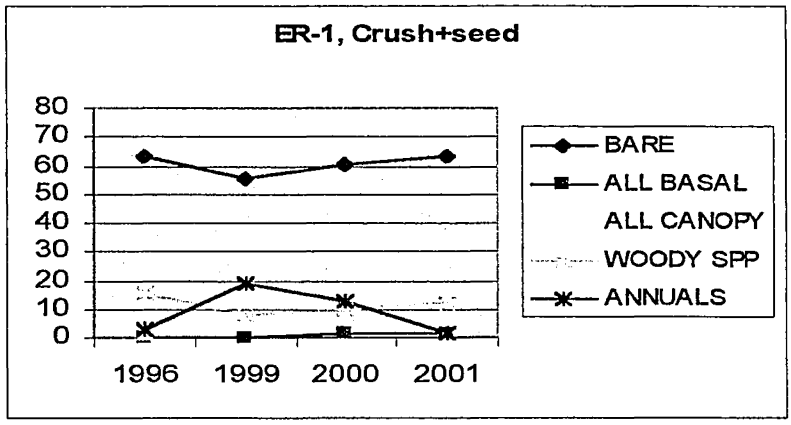
WG-12, Crush only	Means				t-test P		
	1996	1999	2000	2001	96-99	96-00	96-01
SOIL		17.1	33.9	27.7			
ROCK		3.1	5.3	3.9			
BARE	37.5	20.2	39.2	31.6	0.00	0.65	0.11
LITTER	8.6	3.5	19.3	12.9	0.01	0.00	0.05
ANN FORB	8.9	47.0	10.6	28.8	0.00	0.41	0.00
PRGL	4.2	3.1	3.2	3.4	0.33	0.26	0.44
ANN GRASS	26.6	25.6	16.9	8.6	0.83	0.01	0.00
WHITETHORN	10.0	8.0	8.2	7.2	0.24	0.18	0.06
GUSA	2.3	3.9	0.5	1.6	0.15	0.02	0.40
MUPO BAS	0.1	0.0	0.0	0.0	0.34	0.34	0.34
MUPO CAN	2.3	0.7	0.4	0.2	0.03	0.01	0.00
DICA BAS	0.0	0.0	0.0	0.0			
DICA CAN	0.9	0.0	0.0	0.1	0.03	0.03	0.05
HIMU BAS	0.4	0.1	0.6	0.1	0.31	0.70	0.31
HIMU CAN	2.0	0.8	1.8	1.0	0.21	0.87	0.27
ARIS BAS	0.1	0.1	0.1	0.1	1.00	1.00	1.00
ARIS CAN	2.0	1.6	1.1	0.9	0.58	0.22	0.10
PAOB BAS	0.1	0.1	0.1	0.5	1.00	1.00	0.19
PAOB CAN	1.4	1.8	1.2	3.7	0.45	0.73	0.02
SEMA BAS	0.0	0.0	0.0	0.0			
SEMA CAN	0.4	0.0	0.1	0.1	0.04	0.14	0.14
BOFI BAS	0.0	0.0	0.2	0.4		0.17	0.22
BOFI CAN	0.4	0.1	0.6	1.2	0.48	0.71	0.39
BOBA BAS	0.0	0.0	0.0	0.0			
BOBA CAN	0.1	0.0	0.0	0.0	0.34	0.34	0.34
HODE	0.1	0.0	0.0	0.3	0.34	0.34	0.29
SOEL	0.1	0.3	0.0	0.0	0.29	0.34	0.34
SPWR BAS	0.1	0.0	0.0	0.0	0.34	0.34	0.34
SPWR CAN				0.0			
BORO BAS				0.2			
BORO CAN				2.4			
BOGR BAS				0.3			
BOGR CAN				3.2			
BOER BAS				0.0			
BOER CAN				0.2			
BOCU BAS				0.2			
BOCU CAN				0.3			
ALL BASAL	0.7	0.2	0.9	1.3	0.19	0.71	0.30
ALL CANOPY	8.1	3.2	4.0	9.6	0.00	0.01	0.43
WOODY SPP	14.2	11.1	11.4	10.6	0.16	0.04	0.01
ANNUALS	35.5	72.6	27.5	37.4	0.00	0.04	0.63

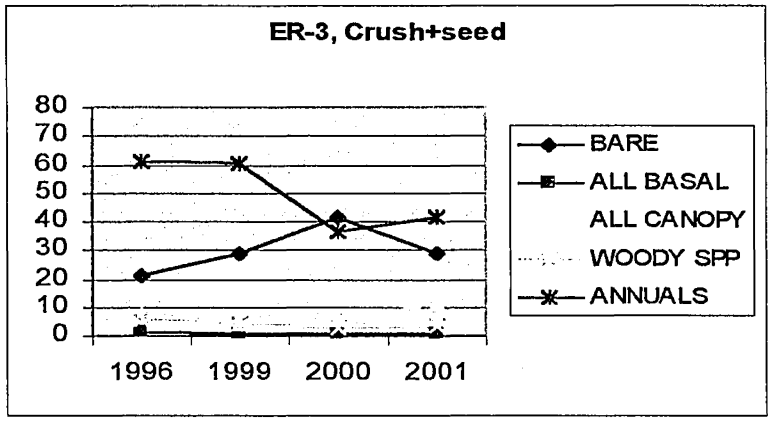

ER-2, Control
60
50
40
30
20
10
0
1996
1999
2000
2001
BARE
ALL BASAL
ALL CANOPY
WOODY SPP
ANNUALS

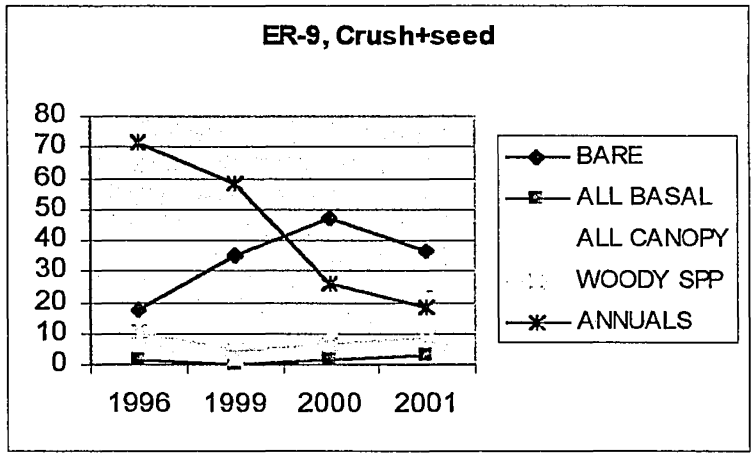

ER-6, Control
60
50
40
30
20
10
0
1996
1999
2000
2001
BARE
ALL BASAL
ALL CANOPY
WOODY SPP
ANNUALS

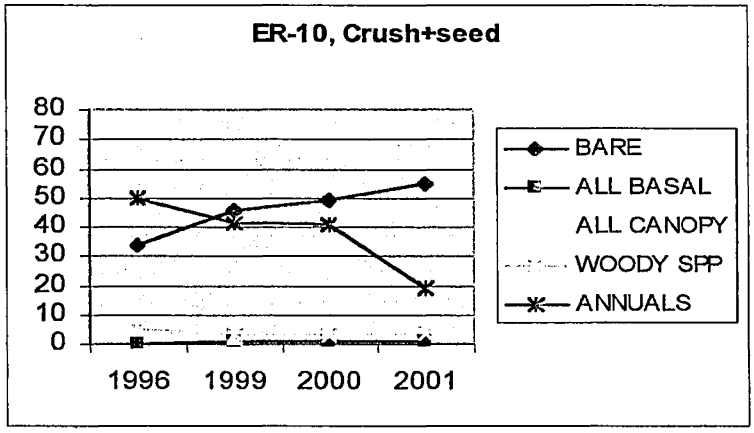

ER-8, Control
60
50
40
30
20
10
0
1996
1999
2000
2001
BARE
ALL BASAL
ALL CANOPY
WOODY SPP
ANNUALS

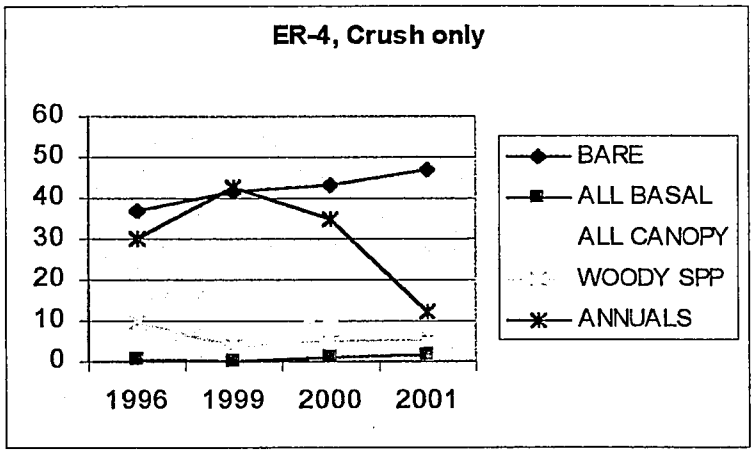

ER-12, Control
60
50
40
30
20
10
0
1996
1999
2000
2001
BARE
ALL BASAL
ALL CANOPY
WOODY SPP
ANNUALS

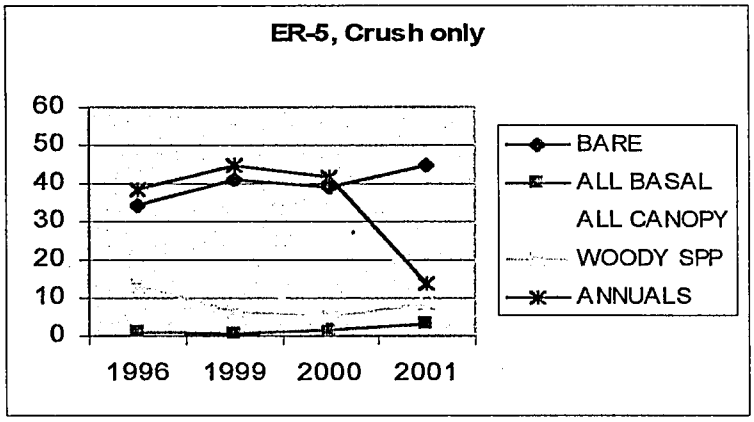

ER-1, Crush+seed
80
70
60
50
40
30
20
10
0
1996
1999
2000
2001
BARE
ALL BASAL
ALL CANOPY
WOODY SPP
ANNUALS

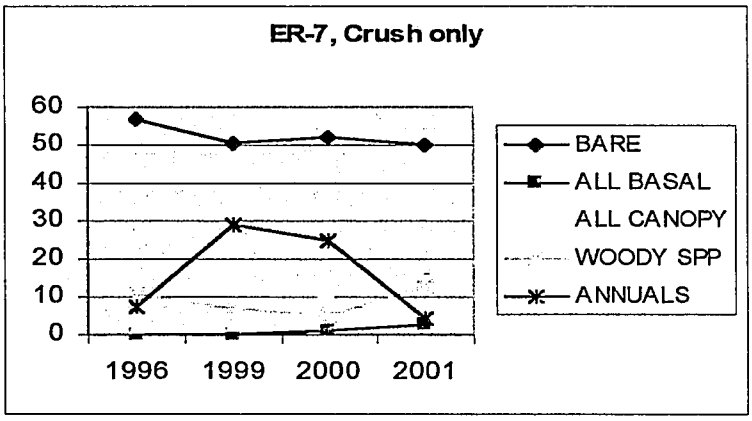

ER-3, Crush+seed
80
70
60
50
40
30
20
10
0
1996
1999
2000
2001
BARE
ALL BASAL
ALL CANOPY
WOODY SPP
ANNUALS

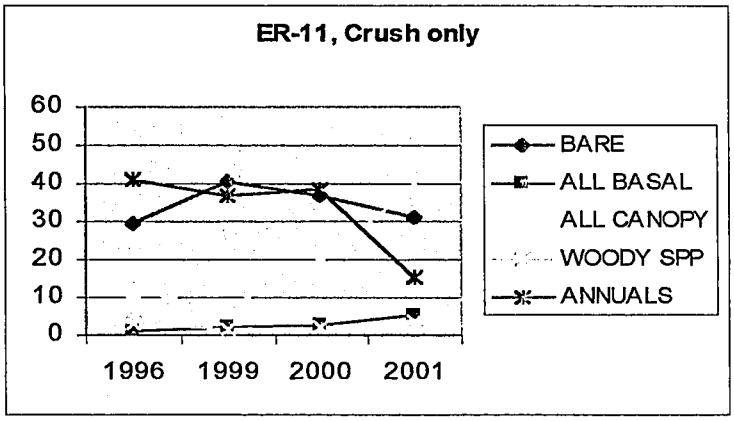

ER-9, Crush+seed
80
70
60
50
40
30
20
10
0
1996
1999
2000
2001
BARE
ALL BASAL
ALL CANOPY
WOODY SPP
ANNUALS

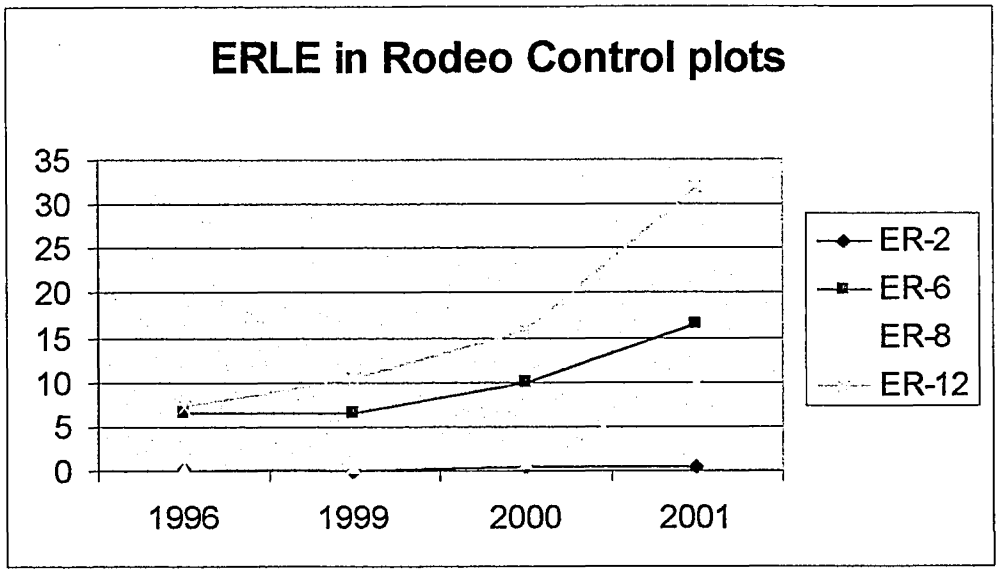

ER-10, Crush+seed
80
70
60
50
40
30
20
10
0
1996
1999
2000
2001
BARE
ALL BASAL
ALL CANOPY
WOODY SPP
ANNUALS

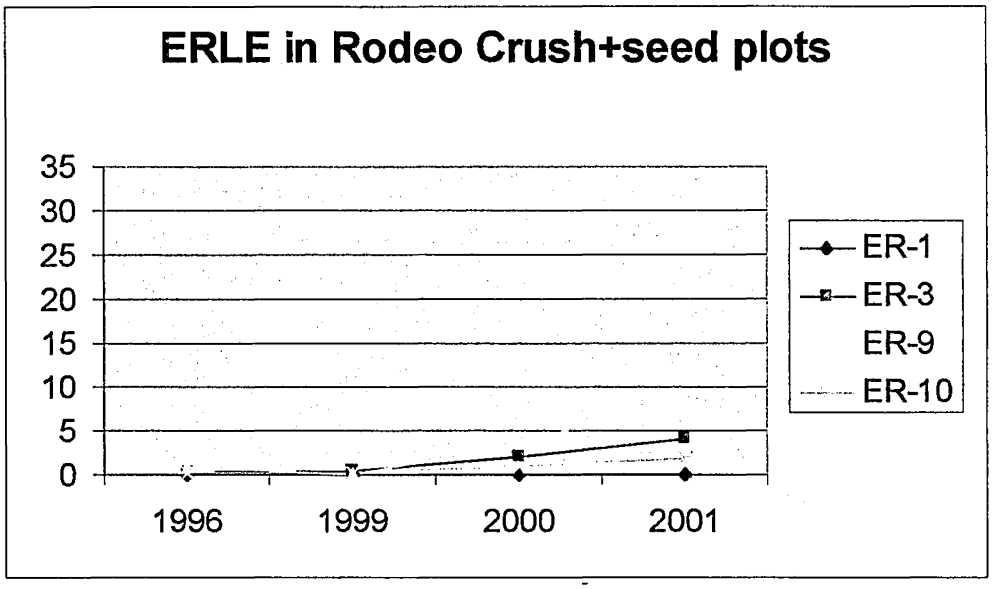

ER-4, Crush only
60
50
40
30
20
10
0
1996
1999
2000
2001
BARE
ALL BASAL
ALL CANOPY
WOODY SPP
ANNUALS

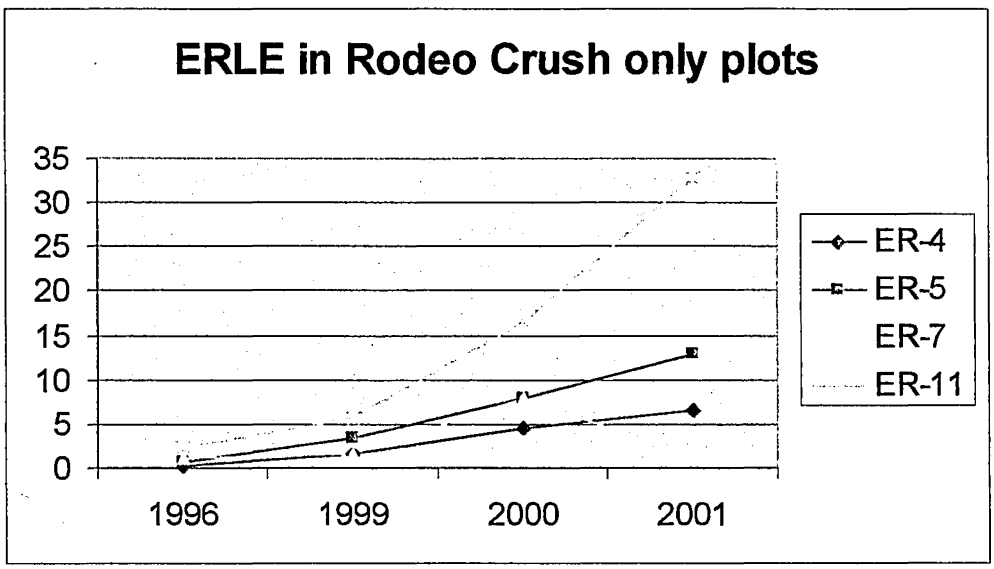

ER-5, Crush only
60
50
40
30
20
10
0
1996
1999
2000
2001
BARE
ALL BASAL
ALL CANOPY
WOODY SPP
ANNUALS


ER-7, Crush only
60
50
40
30
20
10
0
1996
1999
2000
2001
BARE
ALL BASAL
ALL CANOPY
WOODY SPP
ANNUALS


ER-11, Crush only
60
50
40
30
20
10
0
1996
1999
2000
2001
BARE
ALL BASAL
ALL CANOPY
WOODY SPP
ANNUALS


ERLE in Rodeo Control plots
35
30
25
20
15
10
5
0
1996
1999
2000
2001
ER-2
ER-6
ER-8
ER-12


ERLE in Rodeo Crush+seed plots
35
30
25
20
15
10
5
0
1996
1999
2000
2001
ER-1
ER-3
ER-9
ER-10


ERLE in Rodeo Crush only plots
35
30
25
20
15
10
5
0
1996
1999
2000
2001
ER-4
ER-5
ER-7
ER-11

ER-1. Crush+seed

	Means				t-test P		
	1996	1999	2000	2001	96-99	96-00	96-01
SOIL		54.4	59.4	62.3			
ROCK		1.3	0.8	0.9			
BARE	63.1	55.7	60.2	63.2	0.09	0.36	0.98
LITTER	11.6	7.5	9 0	9.3	0.05	0.18	0.28
PRGL	13.6	7.0	9.8	11.7	0.00	0.10	0.35
FORB	1.4	15.8	8.6	1.1	0.00	0.00	0.64
ANN GRAS	1.3	3.2	4.1	0.4	0.02	0.02	0.12
EPHEDRA	1.1	0.2	0.1	0.1	0.00	0.00	0.00
ISTE	5.7	6.6	4.3	8.0	0.48	0.34	0.13
YUEL	0.7	0.2	0.2	0.0	0.07	0.07	0.01
TAAU	0.7	0.9	0.2	0.1	0.67	0.15	0.08
MUPO CAN	0.7	0.1	0.2	0.1	0.05	0.11	0.05
ARIS CAN	0.1	0.0	0.0	0.0	0.34	0.34	0.34
SEMA CAN	0.3	5.1	6.5	6.2	0.00	0.00	0.00
SEMA BAS			1.6	1.1			
SPOR CAN				0.3			
ALL BASAL	0.0	0.0	1.6	1.1		0.01	0.00
ALL CANOPY	1.1	5.2	6.7	6.6	0.00	0.00	0.01
WOODY SPP	15.4	7.4	10.1	11.8	0.00	0.03	0.08
ANNUALS	2.7	19.0	12.7	1.5	0.00	0.00	0.25

ER-2, Control

	Means				t-test P		
	1996	1999	2000	2001	96-99	96-00	96-01
SOIL		43.9	56 7	52.7			
ROCK		2.3	2.2	2.3			
BARE	50.2	46.1	52.9	55.0	0.27	0.44	0.28
PRGL	21.8	21.3	18.0	20.5	0.85	0.18	0.69
LITTER	13.9	7.9	9.7	8.1	0.02	0.02	0.01
ISTE	9.5	17.3	9.1	11.4	0.00	0.72	0.10
ANN FORB	2.7	5.8	6.4	0.4	0.07	0.03	0.12
ANN GRAS	2.0	0.6	3.0	0.8	0.19	0.44	0.27
MUPO CAN	1.7	2.0	1.8	1.5	0.69	0.90	0.82
EPHEDRA	0.9	0.9	1.2	0.6	0.96	0.66	0.53
GUSA	0.4	0.9	0.1	0.6	0.36	0.24	0.53
SOEL	0.2	0.0	0 0	0.0	0.34	0.34	0.34
ERLE CAN	0.2	0.0	0.5	0.4	0.34	0.26	0.59
SEMA CAN	0.2	1.1	2.3	3.7	0.04	0.02	0.00
ARIS CAN	0.1	0.0	0.0	0.1	0.34	0.34	1.00
ACOU	0.1	0.5	0.3	0.0	0.19	0.41	0.34
MIBI	0.1	0.1	0.0	0.3	0.88	0.34	0.41
YUEL	0.1	0.0	0.0	0.0	0.34	0.34	0.34
DICA CAN	0.1	0.0	0.1	0.0	0.34	1.00	0.34
SPOR CAN				0.3			
ALL BASAL							
ALL CANOPY	2.3	2.5	4.7	6.0	0.84	0.08	0.01
WOODY SPP	21.9	17.0	18.0	20.5	0.21	0.16	0.67
ANNUALS	4.7	5.1	9.4	1.2	0.84	0.05	0.06

ER-3, Crush+seed

	Means				t-test P		
	1996	1999	2000	2001	96-99	96-00	96-01
SOIL		27.1	40.0	26.1			
ROCK		2.0	1.6	3.0			
BARE	21.4	29.1	41.6	29.1	0.11	0.00	0.13
ANN GRAS	38.5	25.8	30.4	25.5	0.02	0.10	0.03
FORB	22.5	34.4	6.2	16.0	0.00	0.00	0.08
LITTER	8.0	5.6	12.9	12.0	0.23	0.01	0.03
ISTE	7.3	3.7	1.1	4.5	0.00	0.00	0.03
PRGL	5.9	3.9	2.7	3.8	0.23	0.01	0.12
MUPO CAN	4.2	1.1	0.4	0.5	0.01	0.00	0.00
SPCO CAN	1.5	0.3	1.7	2.5	0.01	0.83	0.39
EPHEDRA	1.2	0.6	0.0	0.7	0.12	0.00	0.15
SEMA CAN	0.8	1.8	3.2	6.7	0.13	0.00	0.00
DICA BAS	0.5	0.0	0.0	0.0	0.24	0.24	0.24
DICA CAN	0.3	0.0	0.0	0.0	0.19	0.19	0.19
SPCO BAS	0.3	0.1	0.2	0.3	0.29	0.70	1.00
MUPO BAS	0.3	0.2	0.0	0.0	0.63	0.08	0.08
GUSA	0.2	0.5	0.0	0.7	0.34	0.17	0.15
ERLE CAN	0.2	0.4	2.1	4.1	0.56	0.01	0.00
SEMA BAS	0.2	0.4	0.8	0.7	0.45	0.11	0.19
ZIGR	0.1	0.0	0.0	0.0	0.34	0.34	0.34
BOER CAN	0.1	0.0	0.0	0.0	0.34	0.34	0.34
4WING	0.1	0.2	0.0	0.0	0.66	0.34	0.34
ARIS CAN	0.1	0.0	0.1	0.1	0.34	1.00	1.00
SPFL CAN	0.1	0.0	0.0	0.6	0.34	0.34	0.35
ALL BASAL	1.3	0.7	1.0	1.0	0.30	0.60	0.61
ALL CANOPY	7.7	3.9	5.4	11.1	0.02	0.20	0.13
WOODY SPP	5.9	3.9	2.7	3.8	0.23	0.01	0.12
ANNUALS	61.0	60.2	36.6	41.5	0.91	0.00	0.03

ER-4, Crush only

	Means				t-test P		
	1996	1999	2000	2001	96-99	96-00	96-01
SOIL		38.8	39.5	45.1			
ROCK		2.6	3.5	1.7			
BARE	36.9	41.4	43.0	46.8	0.11	0.24	0.01
LITTER	10.2	6.9	8.0	10.6	0.19	0.37	0.87
PRGL	9.3	3.5	4.9	5.0	0.00	0.03	0.02
ANN FORB	13.7	32.9	9.2	5.7	0.00	0.04	0.00
ANN GRAS	16.5	9.6	25.4	6.4	0.03	0.09	0.00
ISTE	10.2	6.5	2.2	9.7	0.05	0.00	0.76
SPCO CAN	1.0	0.1	1.5	2.8	0.04	0.46	0.09
EPHEDRA	0.6	0.2	0.0	0.0	0.14	0.02	0.02
SEMA BAS	0.1	0.2	1.0	1.4	0.56	0.04	0.01
SEMA CAN	1.3	1.6	4.8	7.2	0.68	0.02	0.00
MUPO CAN	2.3	0.4	0.5	0.6	0.01	0.02	0.02
DICA CAN	0.3	0.2	0.0	0.1	0.63	0.08	0.29
ARIS BAS	0.3	0.0	0.1	0.2	0.08	0.29	0.63
ARIS CAN	1.1	0.1	0.1	0.2	0.04	0.04	0.06
ERLE CAN	0.3	1.6	4.6	6.6	0.06	0.01	0.02
CABA	0.1	0.0	0.0	0.0	0.34	0.34	0.34
SPFL CAN	0.3	0.0	0.0	0.6	0.08	0.08	0.40
YUEL	0.2	0.0	0.1	0.1	0.17	0.56	0.56
CRCO	0.6	0.0	0.0	0.0	0.11	0.11	0.11
TAAU	0.4	0.2	0.1	0.2	0.45	0.24	0.51
GUSA	0.1	0.5	0.0	0.1	0.13	0.34	1.00
DAPU CAN	0.1	0.1	0.0	0.0	1.00	0.34	0.34
ACOU	0.1	0.1	0.0	0.0	1.00	0.34	0.34
SOEL	0.1	0.0	0.2	0.0	0.34	0.56	0.34
OPLEP	0.1	0.0	0.0	0.0	0.34	0.34	0.34
ALL BASAL	0.4	0.2	1.1	1.6	0.36	0.09	0.03
ALL CANOPY	6.7	4.1	11.5	18.1	0.14	0.10	0.00
WOODY SPP	9.6	3.5	5.0	5.1	0.00	0.02	0.01
ANNUALS	30.2	42.5	34.6	12.1	0.00	0.46	0.00

ER-5, Crush only

	Means				t-test P		
	1996	1999	2000	2001	96-99	96-00	96-01
SOIL		38.4	35.8	42.1			
ROCK		2.6	3.1	2.4			
BARE	34.2	41.0	38.9	44.5	0.01	0.13	0.05
LITTER	8.6	3.9	5.9	8.8	0.01	0.13	0.91
FORB	14.1	32.9	15.9	4.0	0.00	0.22	0.00
PRGL	12.6	5.9	4.2	8.0	0.01	0.00	0.13
ANN GRAS	24.2	11.6	25.6	9.5	0.00	0.72	0.00
SPCO BAS	0.1	0.0	0.2	0.3	0.34	0.66	0.41
SPCO CAN	0.5	0.1	1.2	1.7	0.19	0.18	0.15
ISTE	2.0	1.2	1.0	3.5	0.32	0.20	0.13
ARIS BAS	0.3	0.2	0.1	0.2	0.63	0.29	0.63
ARIS CAN	3.0	0.3	0.7	0.9	0.00	0.01	0.02
EPHEDRA	0.8	0.3	0.8	0.2	0.10	1.00	0.02
TAAU	0.8	0.3	0.5	0.0	0.22	0.49	0.04
SEMA BAS	0.2	0.1	0.9	1.3	0.56	0.19	0.01
SEMA CAN	1.2	0.7	3.5	6.3	0.47	0.01	0.01
CRCO	0.1	0.1	0.0	0.1	1.00	0.34	1.00
GUSA	1.7	3.3	0.3	2.7	0.10	0.03	0.24
MUPO BAS	0.3	0.1	0.0	0.0	0.29	0.08	0.08
MUPO CAN	2.2	0.7	0.9	0.5	0.03	0.04	0.60
YUEL	0.4	0.3	0.5	0.2	0.66	0.75	0.36
ERLE BAS	0.2	0.2	0.4	1.6	1.00	0.45	0.04
ERLE CAN	0.6	3.5	7.9	12.8	0.02	0.00	0.00
SPSP	0.1	0.0	0.1	0.1	0.34	1.00	1.00
DICA BAS	0.0	0.0	0.1	0.0		0.34	
DICA CAN	0.3	0.0	0.3	0.0	0.08	1.00	0.08
ACOU	0.3	0.7	0.1	0.0	0.41	0.41	0.19
ALL BASAL	1.1	0.6	1.7	3.4	0.32	0.49	0.01
ALL CANOPY	7.8	5.3	14.5	22.2	0.11	0.00	0.00
WOODY SPP	13.0	6.2	4.7	8.2	0.01	0.00	0.11
ANNUALS	38.3	44.5	41.5	13.5	0.06	0.46	0.00

ER-6, Control

	Means				t-test P		
	1996	1999	2000	2001	96-99	96-00	96-01
SOIL		41.8	42.3	38.7			
ROCK		1.8	1.7	2.1			
BARE	27.3	43.5	44.2	40.8	0.00	0.01	0.01
LITTER	8.7	5.8	8.7	14.0	0.03	1.00	0.00
ANN FORB	19.1	18.9	9.0	1.2	0.95	0.01	0.00
PRGL	7.1	4.6	6.2	7.3	0.17	0.71	0.90
ANN GRAS	22.6	5.6	19.6	9.5	0.01	0.62	0.03
ARIS BAS	0.4	0.6	0.2	0.6	0.56	0.51	0.53
ARIS CAN	4.2	2.3	1.3	2.7	0.07	0.01	0.20
EPHEDRA	1.0	0.6	0.3	1.1	0.28	0.02	0.75
MUPO BAS	0.0	0.0	0.3	1.2		0.34	0.01
MUPO CAN	1.2	3.1	3.4	3.9	0.14	0.00	0.02
SEMA BAS	0.4	0.3	0.3	0.3	0.59	0.75	0.75
SEMA CAN	1.2	1.3	1.2	2.9	0.94	1.00	0.02
ISTE	6.8	12.1	2.3	4.5	0.00	0.00	0.02
GUSA	0.6	1.5	0.0	0.3	0.10	0.11	0.47
SPCO BAS	0.0	0.0	0.1	0.3		0.34	0.08
SPCO CAN	0.4	0.1	0.2	0.8	0.20	0.36	0.25
CRCO	0.5	0.1	0.2	0.4	0.28	0.39	0.79
ERLE BAS	0.7	0.1	0.5	2.9	0.07	0.68	0.05
ERLE CAN	6.5	6.5	10.0	16.4	1.00	0.32	0.02
YUEL	1.1	0.5	0.3	1.1	0.14	0.02	1.00
CABA	0.1	0.0	0.0	0.0	0.34	0.34	0.34
DICA BAS	0.0	0.0	0.0	0.0			
DICA CAN	0.1	0.1	0.1	0.0	0.88	1.00	0.34
ALL BASAL	1.5	0.8	1.4	5.3	0.25	0.91	0.00
ALL CANOPY	13.6	10.7	16.2	26.7	0.41	0.52	0.00
WOODY SPP	8.2	4.1	6.5	8.4	0.05	0.50	0.91
ANNUALS	41.7	19.6	28.6	10.7	0.01	0.12	0.00

ER-7, Crush only

	Means				t-test P		
	1996	1999	2000	2001	96-99	96-00	96-01
SOIL		48.4	49.4	48.6			
ROCK		2.1	2.8	1.6			
BARE	56.7	50.5	52.2	50.2	0.09	0.20	0.18
LITTER	14.3	6.7	8.7	14.8	0.00	0.00	0.85
ANN FORB	5.5	23.0	8.5	1.4	0.00	0.12	0.01
PRGL	10.4	7.1	4.9	12.5	0.22	0.03	0.55
ANN GRAS	2.0	6.1	16.0	3.0	0.06	0.00	0.45
ISTE	8.1	6.9	3.3	3.0	0.23	0.00	0.00
TAAU	0.5	0.3	0.3	0.0	0.47	0.47	0.05
DAPU BAS	0.1	0.0	0.0	0.0	0.34	0.34	0.34
DAPU CAN	0.1	0.0	0.0	0.0	0.34	0.34	0.34
EPHEDRA	0.4	0.1	0.0	0.7	0.14	0.04	0.52
ERLE BAS	0.0	0.0	0.7	0.2		0.07	0.17
ERLE CAN	1.2	1.6	8.0	~~0.8~~ 1.4	0.78	0.03	0.62
GUSA	0.3	0.4	0.2	3.3	0.66	0.70	0.00
ARIS BAS	0.0	0.0	0.0	0.1			0.34
ARIS CAN	0.6	0.0	0.0	1.5	0.08	0.08	0.07
SEMA BAS	0.0	0.1	0.4	0.9	0.34	0.10	0.02
SEMA CAN	0.1	1.2	2.5	5.0	0.04	0.01	0.00
SPOR BAS				1.2			
SPOR CAN				6.7			
MUPO BAS				0.4			
MUPO CAN				2.2			
ALL BASAL	0.1	0.1	1.1	2.8	1.00	0.01	0.01
ALL CANOPY	2.0	2.8	10.5	16.2	0.66	0.02	0.00
WOODY SPP	10.4	7.1	4.9	12.5	0.22	0.03	0.55
ANNUALS	7.5	29.1	24.5	4.4	0.00	0.00	0.18

ER-8, Control

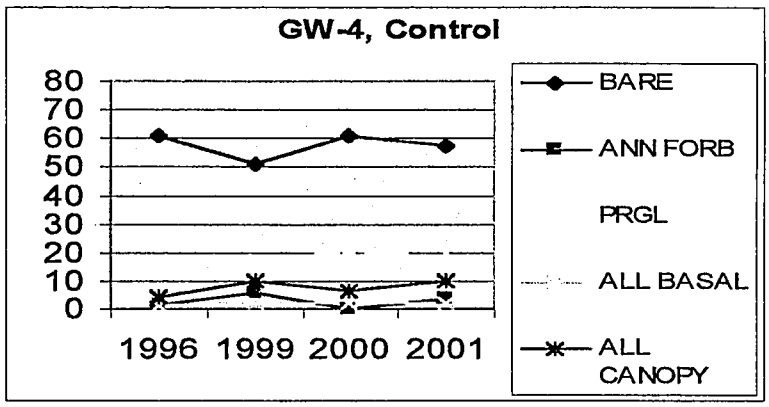
	Means				t-test P		
	1996	1999	2000	2001	96-99	96-00	96-01
SOIL		39.6	44.8	51.6			
ROCK		2.9	0.9	2.1			
BARE	29.9	42.5	45.7	53.7	0.02	0.01	0.00
LITTER	11.9	4.6	7.5	11.5	0.00	0.01	0.85
ANN FORB	21.8	22.0	11.7	1.8	0.95	0.00	0.00
PRGL	10.0	11.5	11.0	7.6	0.61	0.69	0.26
ANN GRAS	19.6	7.3	17.2	1.8	0.00	0.60	0.00
ISTE	3.0	4.6	1.0	10.3	0.31	0.03	0.00
ACOU	0.2	0.1	0.1	0.0	0.76	0.66	0.34
ARIS BAS	0.2	0.3	0.0	0.0	0.82	0.17	0.17
ARIS CAN	3.3	1.5	1.7	0.0	0.03	0.06	0.00
GUSA	1.2	6.6	0.5	0.2	0.00	0.12	0.02
YUEL	0.3	0.4	0.2	0.0	0.76	0.63	0.08
SPCO BAS	0.6	0.0	0.3	0.0	0.05	0.35	0.05
SPCO CAN	2.7	1.0	1.7	1.1	0.10	0.35	0.18
MUPO BAS	0.1	0.3	0.5	0.0	0.45	0.19	0.34
MUPO CAN	2.3	2.9	4.4	0.0	0.43	0.05	0.00
DICA BAS	0.1	0.0	0.0	0.0	0.34	0.34	0.34
DICA CAN	0.2	0.0	0.4	0.0	0.17	0.36	0.17
SPFL BAS	0.0	0.0	0.0	0.0			
SPFL CAN	0.2	0.0	0.0	0.0	0.34	0.34	0.34
EPHEDRA	1.1	0.1	0.4	0.0	0.10	0.24	0.07
SEMA BAS	0.0	0.1	0.9	1.3	0.35	0.03	0.02
SEMA CAN	0.4	3.0	4.0	3.7	0.00	0.02	0.00
CRCO	0.1	0.0	0.0	0.0	0.34	0.34	0.34
ERLE BAS	0.1	0.0	0.2	1.3	0.34	0.56	0.03
ERLE CAN	0.2	0.4	0.9	10.0	0.67	0.13	0.00
TAAU				0.4			
ALL BASAL	1.1	0.5	1.9	2.6	0.14	0.16	0.11
ALL CANOPY	9.3	7.0	13.1	14.8	0.26	0.12	0.12
WOODY SPP	10.3	9.5	11.2	7.6	0.79	0.72	0.20
ANNUALS	41.4	23.4	28.9	3.6	0.02	0.08	0.00

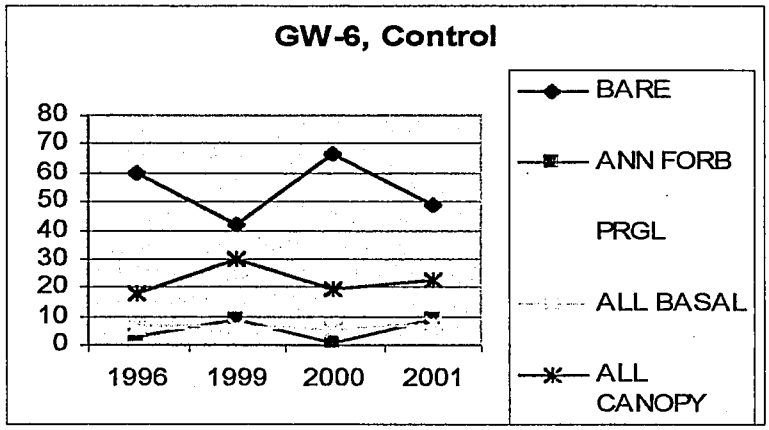
ER-9, Crush+seed	Means				t-test P		
	1996	1999	2000	2001	96-99	96-00	96-01
SOIL		26.9	37.7	30.0			
ROCK		8.4	9.1	6.3			
BARE	17.2	35.3	46.8	36.3	0.00	0.00	0.00
LITTER	12.2	5.5	11.0	11.5	0.11	0.78	0.86
ANN FORB	29.1	34.3	6.6	7.3	0.11	0.00	0.00
PRGL	9.9	4.3	6.4	8.1	0.02	0.13	0.44
ANN GRAS	42.7	23.9	19.7	10.9	0.00	0.00	0.00
ISTE	3.5	1.7	3.0	6.3	0.01	0.50	0.07
GUSA	0.7	0.2	0.1	0.6	0.15	0.08	0.79
EPHEDRA	2.4	1.0	0.5	1.8	0.13	0.03	0.47
ARIS BAS	0.0	0.0	0.0	0.0			
ARIS CAN	0.2	0.0	0.0	0.0	0.17	0.17	0.17
MUPO BAS	0.4	0.0	0.1	0.5	0.17	0.31	0.78
MUPO CAN	3.9	0.6	0.4	1.5	0.02	0.01	0.08
ERLE BAS	0.2	0.0	0.3	0.3	0.34	0.70	0.74
ERLE CAN	0.8	0.1	3.7	8.6	0.07	0.00	0.00
SPCO BAS	0.0	0.0	0.1	0.1		0.34	0.34
SPCO CAN	0.1	0.1	0.4	1.5	1.00	0.31	0.17
DICA BAS	0.2	0.0	0.0	0.1	0.17	0.17	0.56
DICA CAN	0.4	0.0	0.2	0.5	0.04	0.36	0.67
DAPU BAS	0.3	0.0	0.0	0.0	0.19	0.19	0.19
DAPU CAN	0.5	0.0	0.0	0.0	0.10	0.10	0.10
YUEL	0.7	0.2	0.2	0.1	0.19	0.19	0.12
BARREL	0.1	0.0	0.0	0.0	0.34	0.34	0.34
CHLI	0.4	0.2	0.6	0.3	0.51	0.68	0.75
SEMA BAS	0.0	0.1	0.9	1.5	0.34	0.07	0.00
SEMA CAN	0.3	1.6	4.7	10.2	0.06	0.00	0.00
TAAU	0.1	0.0	0.0	0.0	0.34	0.34	0.34
ALL BASAL	1.1	0.1	1.4	2.5	0.04	0.71	0.05
ALL CANOPY	6.2	2.4	9.4	22.3	0.01	0.08	0.00
WOODY SPP	10.6	4.5	6.6	8.2	0.02	0.10	0.33
ANNUALS	71.8	58.2	26.3	18.2	0.02	0.00	0.00

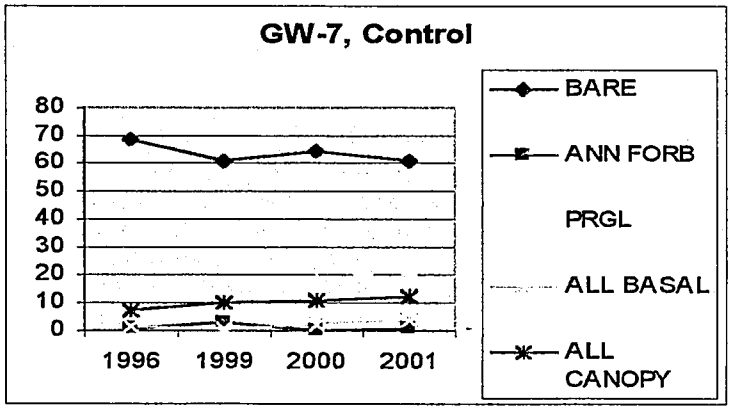
ER-10, Crush+seed	Means				t-test P		
	1996	1999	2000	2001	96-99	96-00	96-01
SOIL		42.1	45.8	53.9			
ROCK		3.5	3.3	2.1			
BARE	33.5	45.6	49.1	55.0	0.00	0.00	0.00
LITTER	6.0	6.7	7.1	10.5	0.57	0.28	0.00
ANN FORB	13.7	27.2	11.0	3.2	0.00	0.14	0.00
PRGL	4.0	2.3	2.6	3.2	0.20	0.27	0.57
ANN GRAS	36.3	14.1	29.7	15.6	0.00	0.18	0.00
MUPO BAS	0.1	0.3	0.0	0.2	0.41	0.34	0.56
MUPO CAN	2.8	0.5	0.4	0.3	0.01	0.01	0.01
DICA BAS	0.0	0.1	0.2	0.0	0.34	0.17	
DICA CAN	0.1	0.2	0.4	0.0	0.56	0.24	0.34
ISTE	7.6	5.7	1.4	4.7	0.30	0.00	0.09
ERLE BAS	0.0	0.0	0.0	0.2			0.17
ERLE CAN	0.2	0.2	0.8	1.8	1.00	0.05	0.02
ARIS BAS	0.1	0.0	0.0	0.0	0.34	0.34	0.34
ARIS CAN	1.5	0.3	0.0	0.4	0.01	0.00	0.02
YUEL	0.5	0.6	0.4	0.4	0.78	0.75	0.75
SEMA BAS	0.0	0.0	0.5	0.6		0.05	0.01
SEMA CAN	0.6	0.7	2.8	3.8	0.79	0.00	0.01
EPHEDRA	0.3	0.1	0.1	0.0	0.41	0.41	0.19
GUSA	0.3	0.5	0.0	0.4	0.47	0.08	0.71
TARBUSH	0.1	0.0	0.0	0.0	0.34	0.34	0.34
CRCO	0.1	0.0	0.0	0.0	0.34	0.34	0.34
CODI	0.1	0.0	0.0	0.0	0.34	0.34	0.34
ALL BASAL	0.2	0.4	0.7	1.0	0.45	0.11	0.01
ALL CANOPY	5.2	1.9	4.4	6.3	0.00	0.44	0.32
WOODY SPP	4.6	2.9	3.0	3.6	0.22	0.23	0.52
ANNUALS	50.0	41.3	40.7	18.8	0.13	0.12	0.00

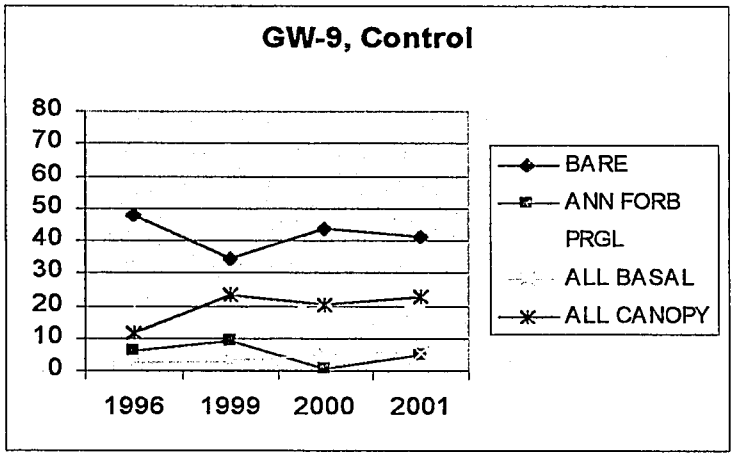
ER-11. Crush only	Means				t-test P		
	1996	1999	2000	2001	96-99	96-00	96-01
SOIL		37.6	33.3	29.0			
ROCK		3.1	3.4	2.3			
BARE	29.3	40.7	36.7	31.3	0.00	0.12	0.64
LITTER	10.5	8.3	7.1	10.4	0.08	0.02	0.93
ANN FORB	16.0	27.8	6.6	2.2	0.00	0.00	0.00
PRGL	2.6	1.6	1.7	2.7	0.40	0.40	0.94
ANN GRAS	25.3	9.0	32.0	12.9	0.00	0.17	0.00
YUEL	0.6	0.0	0.2	0.8	0.08	0.25	0.66
ISTE	8.5	4.7	2.3	4.8	0.02	0.00	0.02
ARIS BAS	0.2	0.2	0.1	0.0	1.00	0.66	0.34
ARIS CAN	4.6	1.2	0.2	0.7	0.00	0.00	0.00
TAAU	0.2	0.0	0.0	0.0	0.17	0.17	0.17
EPHEDRA	0.9	0.3	0.1	0.1	0.11	0.03	0.03
BOBA BAS	0.0	0.0	0.0	0.0			
BOBA CAN	0.1	0.0	0.1	0.1	0.34	1.00	1.00
GUSA	1.8	1.3	0.0	0.3	0.49	0.01	0.02
DICA BAS	0.1	0.0	0.0	0.0	0.34	0.34	0.34
DICA CAN	0.2	0.0	0.3	0.0	0.17	0.63	0.17
SEMA BAS	0.1	0.1	0.2	0.4	1.00	0.66	0.24
SEMA CAN	0.2	0.2	1.8	1.9	1.00	0.01	0.03
MUPO BAS	0.4	1.0	0.1	0.5	0.25	0.24	0.75
MUPO CAN	2.2	0.0	0.3	1.5	0.01	0.02	0.38
ERIN BAS	0.0	0.0	0.0	0.0			
ERIN CAN	0.1	0.0	0.0	0.0	0.34	0.34	0.34
ERLE BAS	0.0	0.5	2.0	4.2	0.10	0.08	0.01
ERLE CAN	2.3	5.7	16.4	32.7	0.01	0.00	0.00
SPCO BAS	0.2	0.2	0.1	0.1	1.00	0.66	0.66
SPCO CAN	1.6	0.3	0.8	0.5	0.04	0.21	0.09
SPFL BAS	0.2	0.0	0.0	0.1	0.34	0.34	0.66
SPFL CAN	0.4	0.0	0.0	1.5	0.10	0.10	0.11
ALL BASAL	1.2	2.0	2.5	5.3	0.39	0.35	0.01
ALL CANOPY	11.7	7.4	19.9	38.9	0.01	0.01	0.00
WOODY SPP	3.2	1.6	1.9	3.5	0.20	0.24	0.84
ANNUALS	41.3	36.8	38.6	15.1	0.18	0.53	0.00

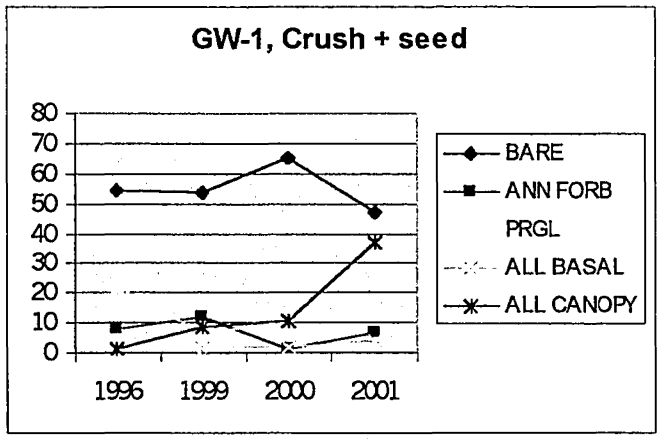
ER-12. Control	Means				t-test P		
	1996	1999	2000	2001	96-99	96-00	96-01
SOIL		38.8	36.8	35.3			
ROCK		1.6	0.7	1.9			
BARE	24.7	40.4	37.5	37.2	0.01	0.04	0.03
LITTER	6.8	6.3	6.8	13.2	0.78	1.00	0.02
ANN FORB	20.6	19.8	7.7	2.4	0.84	0.00	0.00
PRGL	3.6	3.3	5.9	5.9	0.68	0.09	0.17
ANN GRAS	30.2	5.8	26.0	3.5	0.00	0.53	0.00
ISTE	4.6	8.4	1.1	2.9	0.02	0.00	0.13
ARIS BAS	0.5	0.5	0.3	0.4	1.00	0.53	0.78
ARIS CAN	4.6	4.0	1.7	1.6	0.73	0.02	0.02
MUPO BAS	0.0	0.1	0.5	0.5	0.35	0.05	0.14
MUPO CAN	1.6	2.1	2.9	3.0	0.57	0.06	0.08
SEMA BAS	0.2	0.0	0.2	0.2	0.17	1.00	1.00
SEMA CAN	0.6	1.1	1.8	2.2	0.25	0.07	0.04
EPHEDRA	0.1	0.4	0.3	1.0	0.21	0.29	0.06
CRCO	0.7	0.1	0.1	0.2	0.10	0.08	0.15
TAAU	0.3	0.0	0.1	0.3	0.08	0.29	1.00
ERLE BAS	0.2	0.5	2.1	4.9	0.22	0.03	0.00
ERLE CAN	7.2	10.4	15.9	31.8	0.14	0.00	0.00
SOEL	0.1	0.0	0.0	0.1	0.34	0.34	1.00
GUSA	1.5	2.9	0.0	0.6	0.14	0.01	0.14
YUEL	0.5	0.5	0.8	0.4	1.00	0.43	0.79
SPCO BAS	0.1	0.0	0.0	0.2	0.34	0.34	0.56
SPCO CAN	0.4	0.1	0.2	0.5	0.30	0.51	0.78
SPFL CAN	0.1	0.0	0.0	0.0	0.34	0.34	0.34
ALL BASAL	1.0	0.9	3.1	6.2	0.84	0.09	0.00
ALL CANOPY	14.5	14.2	22.5	39.1	0.93	0.00	0.00
WOODY SPP	4.1	3.0	6.7	6.3	0.27	0.07	0.19
ANNUALS	50.8	20.4	33.7	5.9	0.00	0.01	0.00

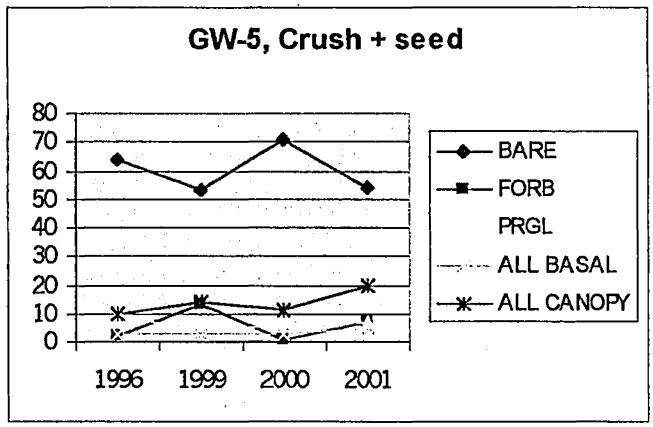

GW-4, Control
80
70
60
50
40
30
20
10
0
1996 1999 2000 2001
BARE
ANN FORB
PRGL
ALL BASAL
ALL CANOPY

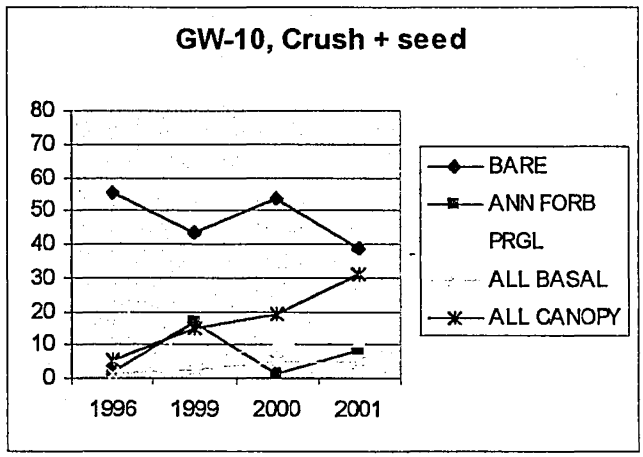

GW-6, Control
80
70
60
50
40
30
20
10
0
1996 1999 2000 2001
BARE
ANN FORB
PRGL
ALL BASAL
ALL CANOPY

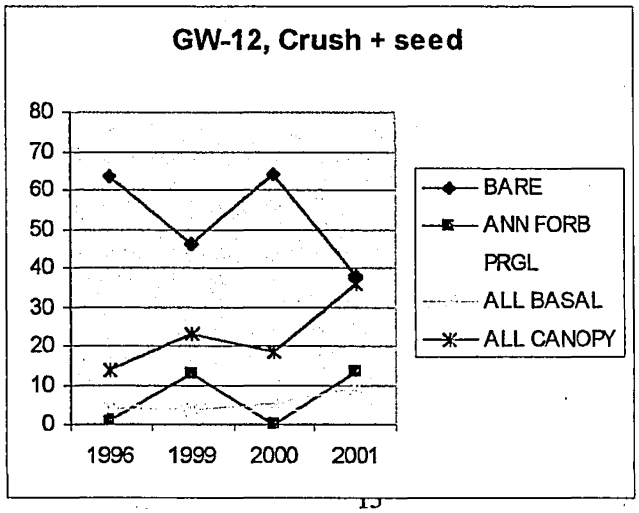

GW-7, Control
80
70
60
50
40
30
20
10
0
1996 1999 2000 2001
BARE
ANN FORB
PRGL
ALL BASAL
ALL CANOPY

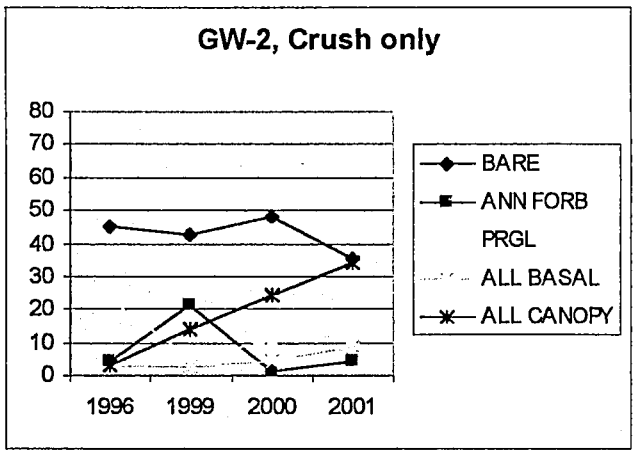

GW-9, Control
80
70
60
50
40
30
20
10
0
1996 1999 2000 2001
BARE
ANN FORB
PRGL
ALL BASAL
ALL CANOPY

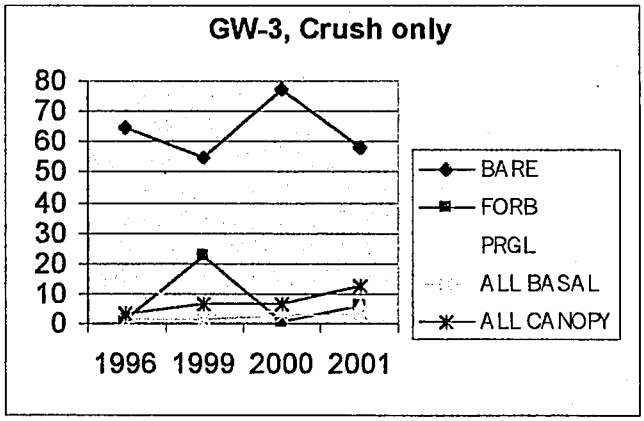

GW-1, Crush + seed
80
70
60
50
40
30
20
10
0
1996
1999
2000
2001
BARE
ANN FORB
PRGL
ALL BASAL
ALL CANOPY

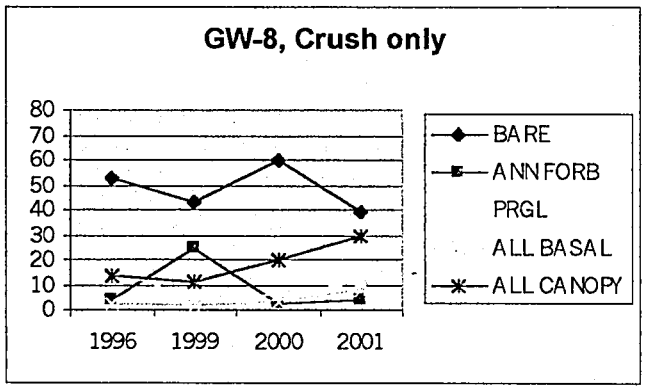

GW-5, Crush + seed
80
70
60
50
40
30
20
10
0
1996
1999
2000
2001
BARE
FORB
PRGL
ALL BASAL
ALL CANOPY

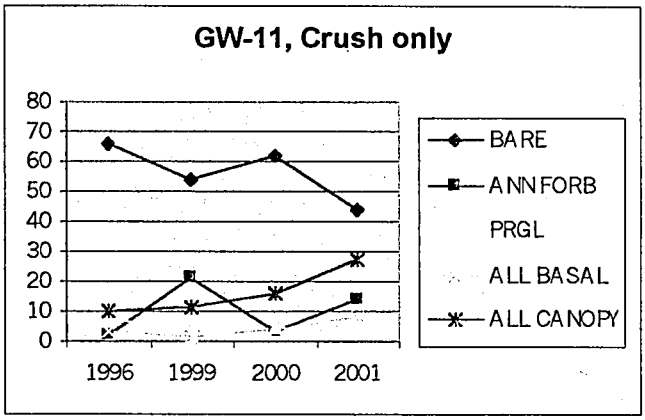

GW-10, Crush + seed
80
70
60
50
40
30
20
10
0
1996
1999
2000
2001
BARE
ANN FORB
PRGL
ALL BASAL
ALL CANOPY


GW-12, Crush + seed
80
70
60
50
40
30
20
10
0
1996
1999
2000
2001
BARE
ANN FORB
PRGL
ALL BASAL
ALL CANOPY


GW-2, Crush only
80
70
60
50
40
30
20
10
0
1996
1999
2000
2001
BARE
ANN FORB
PRGL
ALL BASAL
ALL CANOPY


GW-3, Crush only
80
70
60
50
40
30
20
10
0
1996 1999 2000 2001
BARE
FORB
PRGL
ALL BASAL
ALL CANOPY


GW-8, Crush only
80
70
60
50
40
30
20
10
0
1996
1999
2000
2001
BARE
ANN FORB
PRGL
ALL BASAL
ALL CANOPY


GW-11, Crush only
80
70
60
50
40
30
20
10
0
1996
1999
2000
2001
BARE
ANN FORB
PRGL
ALL BASAL
ALL CANOPY

GW-1, Crush+seed	Means				t-test P		
	1996	1999	2000	2001	96-99	96-00	96-01
BARE		53.2	0.6	47.3			
LITTER		0.7	65.0	8.0			
ANN FORB	54.7	53.9	9.8	6.7	0.92	0.00	0.00
ANN GRASS	12.5	8.5	1.2	0.2	0.02	0.00	0.00
PRGL	8.4	11.8	5.2	17.7	0.32	0.35	0.02
GUSA	2.7	12.3	10.4	0.5	0.06	0.00	0.19
SEMA BAS	22.0	7.0	0.1	2.3	0.00	0.00	0.00
SEMA CAN	1.0	0.3	1.5	14.2	0.17	0.43	0.00
HODE		1.2	5.6	0.1			
DESERT BROOM	0.3	3.9	0.1	0.0	0.01	0.41	0.19
BOBA BAS	0.5	1.3	0.1	0.0	0.22	0.24	0.60
BOBA CAN	0.2	0.0	0.3	0.9	0.34	0.74	0.15
PAOB BASAL		0.3	2.4	0.2			
PAOB CANOPY	0.1	2.2	0.0	0.8	0.15	0.34	0.02
MUPO BAS		0.0	0.1	0.0			
MUPO CAN	0.5	0.7	0.0	0.0	0.63	0.05	0.05
SPSP		0.0	0.0	0.0			
CRCO	0.2	0.0	0.0	0.2	0.17	0.17	1.00
BOCO	0.1	0.0	0.0	0.0	0.34	0.34	0.34
ACOU	0.2	0.0	0.0	0.0	0.17	0.17	0.17
ARIS BAS	0.1	0.0	0.0	0.3	0.34	0.34	0.41
ARIS CANOPY	0.1	0.0	0.4	5.0	0.34	0.14	0.00
SOEL		0.1	2.4	0.2			
ISTE	0.1	1.7	0.0	1.8	0.01	0.34	0.06
SILE	0.3	0.0	0.0	0.0	0.19	0.19	0.19
SCBR BAS	0.3	0.2	0.0	0.0	0.70	0.19	0.19
SCBR CAN	0.1	0.0	0.0	0.0	0.34	0.34	0.34
STICKY FORB		0.0	0.0	0.1			
ERLE BAS	0.1	0.0	0.9	0.0	0.34	0.15	0.34
ERLE CAN				2.9			
SPOR BAS				0.0			
SPOR CAN				0.7			
BOCU BAS				0.2			
BOCU CAN				0.8			
ERIN BAS				0.6			
ERIN CAN				4.8			
DICA BAS				0.7			
DICA CAN				5.1			
BOGR CAN				1.1			
LEDU CAN				0.8			
ALL BASAL				4.6			
ALL CANOPY			2.2	36.8			
WOODY SPP	0.0	1.6	10.5	17.7	0.01	0.00	0.00
ANNUALS	1.3	8.5	10.5	6.9	0.01	0.00	0.01

GW-4, Control	Means				t-test P		
	1996	1999	2000	2001	96-99	96-00	96-01
SOIL		49.8	60.4	55.9			
ROCK		0.9	0.8	1.4			
BARE	60.6	50.7	61.2	57.3	0.02	0.87	0.38
LITTER	10.9	10.1	10.4	8.9	0.67	0.75	0.23
ANN FORB	1.4	5.5	0.2	3.2	0.01	0.08	0.15
ANN GRASS	0.5	0.5	0.5	0.0	1.00	1.00	0.14
PRGL	17.2	17.3	20.3	18.2	0.97	0.39	0.78
GUSA	0.3	0.7	0.1	0.6	0.21	0.29	0.44
DAPU BAS	0.1	0.4	0.2	0.1	0.34	0.34	1.00
DAPU CAN	0.2	0.3	0.0	0.8	0.51	1.00	0.14
PAOB BAS	0.2	0.3	0.0	0.1	0.63	0.17	0.56
PAOB CAN	0.5	1.8	0.5	0.8	0.21	1.00	0.49
CRCO	3.7	4.9	2.1	2.3	0.33	0.07	0.09
ARIS BAS	1.0	1.5	1.9	1.9	0.20	0.10	0.08
ARIS CAN	3.8	7.4	5.6	7.6	0.02	0.25	0.04
ACOU	0.1	0.0	0.0	0.0	0.34	0.34	0.34
SOEL	0.2	0.1	0.1	0.0	0.56	0.56	0.17
ASTER	0.1	0.7	0.0	0.2	0.20	0.34	0.56
HODE	0.2	0.1	0.0	0.0	0.56	0.17	0.17
ZIGR	0.5	0.8	0.1	0.3	0.42	0.13	0.47
BAHIA	0.1	0.0	0.0	0.0	0.34	0.34	0.34
SPSP	0.1	0.3	0.0	0.1	0.41	0.34	1.00
MUAR	0.1	0.1	0.0	0.0	1.00	0.34	0.34
BOCU	0.1	0.0	0.0	0.0	0.34	0.34	0.34
TAAU	0.1	0.0	0.0	0.0	0.34	0.34	0.34
ERLE CAN	0.1	0.1	0.1	0.1	1.00	1.00	1.00
KRLA	0.1	0.0	0.0	0.0	0.34	0.34	0.34
SCBR	0.1	0.0	0.2	0.1	0.34	0.66	1.00
SEMA CAN				0.4			
ALL BASAL	1.3	1.8	1.9	2.1	0.40	0.32	0.20
ALL CANOPY	4.6	9.7	6.4	9.7	0.03	0.27	0.02
WOODY SPP	17.2	17.3	20.3	18.2	0.97	0.39	0.78
ANNUALS	1.9	6.0	0.7	3.2	0.02	0.21	0.33

GW-5, Crush+seed	Means				t-test P		
	1996	1999	2000	2001	96-99	96-00	96-01
SOIL		52.3	70.9	53.4			
ROCK		0.7	0.0	0.7			
BARE	63.8	53.0	70.9	54.1	0.00	0.01	0.00
LITTER	9.3	6.5	7.7	6.4	0.08	0.32	0.10
FORB	1.9	13.0	0.7	6.9	0.00	0.05	0.00
PRGL	9.9	3.4	6.3	7.0	0.00	0.04	0.14
PAOB BAS	0.4	1.0	1.3	0.4	0.31	0.11	1.00
PAOB CAN	1.8	5.2	4.3	1.2	0.04	0.07	0.50
ARIS BAS	1.0	0.1	0.5	1.2	0.01	0.12	0.67
ARIS CAN	3.6	3.8	2.6	7.3	0.84	0.27	0.00
CRCO	3.7	4.3	1.6	1.6	0.55	0.03	0.04
HIMU BAS	0.1	0.0	0.1	0.0	0.34	1.00	0.34
HIMU CAN	0.1	0.0	0.1	0.0	0.34	1.00	0.34
HODE	0.1	0.2	0.0	0.0	0.56	0.34	0.34
BOCU BAS	0.6	0.5	0.5	0.5	0.75	0.78	0.72
BOCU CAN	1.5	1.3	1.3	2.2	0.74	0.79	0.33
MUAR BAS	0.5	0.3	0.0	0.5	0.47	0.05	1.00
MUAR CAN	1.2	0.9	0.4	1.0	0.57	0.13	0.77
SILE	0.2	0.1	0.0	0.0	0.56	0.17	0.17
EVOL	0.1	0.2	0.0	0.3	0.56	0.34	0.41
BOER BAS	0.1	0.2	0.1	0.2	0.56	1.00	0.56
BOER CAN	0.5	0.5	0.1	0.7	1.00	0.24	0.65
TAAU	0.3	0.0	0.0	0.4	0.08	0.08	0.71
GUSA	0.7	0.7	0.2	0.4	1.00	0.07	0.34
DAPU BAS	0.3	0.2	0.0	0.4	0.74	0.19	0.77
DAPU CAN	0.6	0.8	0.3	1.1	0.68	0.52	0.30
ANN GRAS	0.5	2.3	1.2	0.0	0.06	0.23	0.05
SCBR CAN	0.1	0.5	0.1	0.2	0.29	1.00	0.56
SEMA BAS	0.0	0.4	0.5	0.9	0.17	0.01	0.09
SEMA CAN	0.2	1.2	2.2	4.5	0.04	0.00	0.00
ZIGR	0.3	1.2	0.1	0.5	0.08	0.25	0.67
ASTER	0.4	1.1	0.0	0.0	0.09	0.04	0.04
MUPO BAS	0.0	0.0	0.0	0.0			
MUPO CAN	0.1	0.0	0.0	0.1	0.34	0.34	1.00
SPFL CAN	0.1	0.0	0.0	0.0	0.34	0.34	0.34
ACOU	0.1	0.0	0.0	0.0	0.34	0.34	0.34
SOEL	0.3	0.0	0.0	0.0	0.19	0.19	0.19
ERWR				2.5			
BOGR BAS				0.5			
BOGR CAN				1.2			
LEDU CAN				0.3			
ERLE CAN				0.4			
ALL BASAL	3.0	2.7	3.0	4.6	0.81	1.00	0.22
ALL CANOPY	9.6	13.7	11.3	19.3	0.22	0.58	0.01
WOODY SPP	9.9	3.4	6.3	7.0	0.00	0.04	0.14
ANNUALS	2.4	15.3	1.9	6.9	0.00	0.56	0.01

GW-6, Control	Means				t-test P		
	1996	1999	2000	2001	96-99	96-00	96-01
SOIL		41.4	65.7	47.8			
ROCK		0.8	0.9	0.9			
BARE	60.1	42.2	66.6	48.7	0.00	0.07	0.00
LITTER	8.8	8.8	5.9	4.5	1.00	0.01	0.00
PRGL	6.0	5.3	6.6	6.4	0.73	0.80	0.85
ANN FORB	3.2	8.8	0.8	8.6	0.00	0.00	0.04
ARIS BAS	3.8	3.8	3.6	4.6	1.00	0.84	0.37
ARIS CANOPY	11.9	19.9	13.5	15.9	0.01	0.40	0.09
CRCO	3.0	5.1	1.7	2.3	0.03	0.16	0.50
EVOL	0.4	0.1	0.1	0.1	0.24	0.24	0.24
BOER BAS	1.6	1.7	0.6	1.4	0.87	0.10	0.78
BOER CAN	3.8	4.9	3.0	3.7	0.35	0.47	0.95
ANN GRAS	0.4	0.2	0.6	0.1	0.45	0.57	0.24
SILE	0.6	0.2	0.0	0.0	0.20	0.05	0.05
HODE	0.2	0.5	0.1	0.4	0.34	0.56	0.36
SPSP	0.1	0.1	0.0	0.1	1.00	0.34	1.00
MUAR BAS	0.4	0.6	0.4	0.5	0.48	1.00	0.75
MUAR CAN	0.7	1.8	0.7	0.7	0.02	1.00	1.00
PAOB BAS	0.2	0.2	0.1	0.4	1.00	0.56	0.45
PAOB CAN	0.6	1.9	1.1	0.9	0.06	0.39	0.56
MUPO BAS	0.0	0.0	0.0	0.0			
MUPO CAN	0.3	0.0	0.0	0.4	0.34	0.34	0.82
ZIGR	0.3	1.0	0.2	0.0	0.14	0.70	0.19
DAPU BAS	0.1	0.1	0.3	0.2	1.00	0.29	0.56
DAPU CAN	0.1	0.2	0.5	0.3	0.56	0.24	0.41
SOEL	0.1	0.0	0.2	0.0	0.34	0.66	0.34
GUSA	0.2	0.2	0.0	0.2	1.00	0.17	1.00
TAAU	0.1	0.0	0.0	0.2	0.34	0.34	0.56
BOGR BAS	0.1	0.1	0.1	0.0	1.00	1.00	0.34
BOGR CAN	0.2	0.1	0.1	0.1	0.66	0.66	0.66
SCBR BAS	0.3	0.4	0.2	0.1	0.81	0.77	0.54
SCBR CAN	0.6	0.8	0.5	0.1	0.73	0.84	0.28
SEMA CAN				0.5			
ALL BASAL	6.5	6.9	5.3	7.2	0.79	0.41	0.64
ALL CANOPY	18.2	29.6	19.4	22.1	0.00	0.70	0.29
WOODY SPP	6.0	5.3	6.6	6.4	0.73	0.80	0.85
ANNUALS	3.6	9.0	1.4	8.7	0.00	0.00	0.04

GW-7, Control	Means				t-test P		
	1996	1999	2000	2001	96-99	96-00	96-01
SOIL		59.1	63.9	60.8			
ROCK		1.6	0.7	0.2			
BARE	68.3	60.7	64.6	61.0	0.04	0.36	0.03
LITTER	8.2	10.7	8.2	6.2	0.07	1.00	0.12
PRGL	15.1	14.9	17.7	22.3	0.93	0.42	0.02
ANN FORB	0.5	2.6	0.1	0.5	0.00	0.06	1.00
ARIS BAS	0.8	0.5	0.1	1.3	0.38	0.30	0.25
ARIS CANOPY	2.0	4.9	1.3	3.5	0.02	0.03	0.20
MUPO BAS	0.0	0.1	0.2	0.2	0.34	0.17	0.17
MUPO CAN	1.0	0.7	1.0	0.4	0.59	1.00	0.25
GUSA	0.7	0.9	0.2	0.6	0.65	0.15	0.79
PAOB BAS	0.2	0.1	0.2	0.8	0.56	1.00	0.20
PAOB CAN	1.4	1.8	0.6	1.9	0.64	0.27	0.53
CRCO	2.0	0.5	0.5	0.2	0.01	0.03	0.00
SILE	0.3	0.1	0.0	0.0	0.29	0.08	0.08
SEMA BAS	0.2	0.1	0.0	0.6	0.56	0.17	0.14
SEMA CAN	0.8	0.5	1.6	2.1	0.42	0.26	0.08
HIMU BAS	0.0	0.1	0.2	0.1	0.34	0.17	0.34
HIMU CAN	0.4	0.6	0.7	0.1	0.71	0.63	0.37
ISTE	0.1	0.9	0.6	1.0	0.02	0.06	0.00
SOEL	0.1	0.0	0.0	0.0	0.34	0.34	0.34
POOB	0.1	0.0	0.0	0.0	0.34	0.34	0.34
ZIGR	0.3	0.2	0.2	0.4	0.63	0.70	0.66
ANN GRAS	0.1	0.2	0.2	0.1	0.66	0.56	1.00
DAPU BAS	0.1	0.0	0.1	0.3	0.34	1.00	0.41
DAPU CAN	0.2	0.6	0.4	0.2	0.39	0.45	1.00
SCBR BAS				0.3			
ALL BASAL	1.3	0.9	2.0	3.6	0.50	0.31	0.01
ALL CANOPY	7.1	10.0	10.8	11.8	0.27	0.20	0.09
WOODY SPP	15.1	14.9	17.7	22.3	0.93	0.42	0.02
ANNUALS	0.6	2.8	0.3	0.6	0.00	0.28	1.00

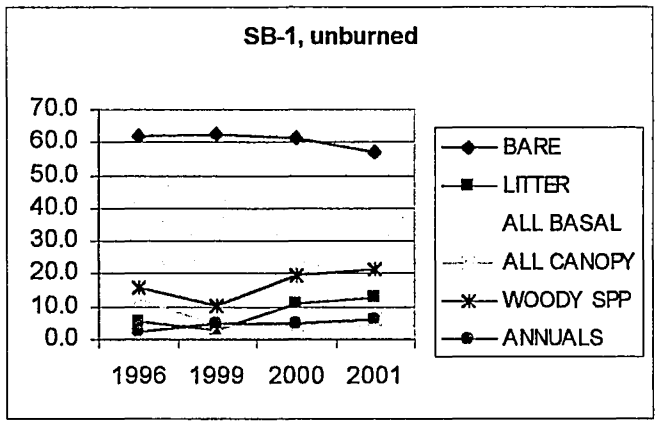
GW-8, Crush only	Means				t-test P		
	1996	1999	2000	2001	96-99	96-00	96-01
SOIL		42.7	59.8	38.6			
ROCK		0.3	0.3	0.4			
BARE	52.9	43.0	60.1	39.0	0.01	0.10	0.00
LITTER	10.3	10.2	7.7	5.6	0.94	0.03	0.00
PRGL	17.1	4.4	6.3	11.3	0.00	0.00	0.01
ANN FORB	3.7	24.7	2.1	3.9	0.00	0.10	0.87
ANN GRAS	0.2	1.1	0.9	0.0	0.02	0.15	0.34
ARIS BAS	2.3	1.3	2.3	6.2	0.09	1.00	0.00
ARIS CANOPY	12.3	9.7	15.9	23.6	0.34	0.21	0.00
SEMA BAS	0.3	0.4	1.3	2.1	0.66	0.04	0.01
SEMA CAN	0.7	1.4	4.2	5.2	0.27	0.00	0.00
CRCO	2.8	2.9	2.4	4.4	0.91	0.61	0.12
GUSA	1.4	1.6	1.2	3.8	0.75	0.72	0.01
SPSP	0.3	0.1	0.0	0.1	0.29	0.08	0.29
ERWR	0.7	0.5	0.1	0.7	0.53	0.05	1.00
SCBR BAS	0.1	0.0	0.0	0.0	0.34	0.34	0.34
SCBR CAN	0.3	0.0	0.1	0.0	0.19	0.41	0.19
ISTE	0.5	0.3	0.8	0.5	0.53	0.66	1.00
SOEL	0.1	0.1	0.0	0.1	1.00	0.34	1.00
ASTER	0.6	0.7	0.0	0.2	0.84	0.08	0.25
EVOL	0.3	0.0	0.1	0.0	0.19	0.41	0.19
SPFL BAS	0.0	0.0	0.0	0.0			
SPFL CAN	0.1	0.0	0.0	0.0	0.34	0.34	0.34
MUPO BAS	0.0	0.1	0.0	0.0	0.34		
MUPO CAN	0.6	0.1	0.0	0.0	0.25	0.17	0.17
BRDE	0.1	0.0	0.0	0.0	0.34	0.34	0.34
DECO	0.1	0.0	0.0	0.0	0.34	0.34	0.34
ZIGR	1.3	1.6	0.9	0.0	0.54	0.42	0.00
DICA BAS				0.5			
DICA CAN				1.0			
ALL BASAL	2.7	1.8	3.6	8.4	0.21	0.32	0.00
ALL CANOPY	14.0	11.2	20.2	29.8	0.39	0.09	0.00
WOODY SPP	17.1	4.4	6.3	11.3	0.00	0.00	0.01
ANNUALS	3.9	25.8	3.0	3.9	0.00	0.40	1.00

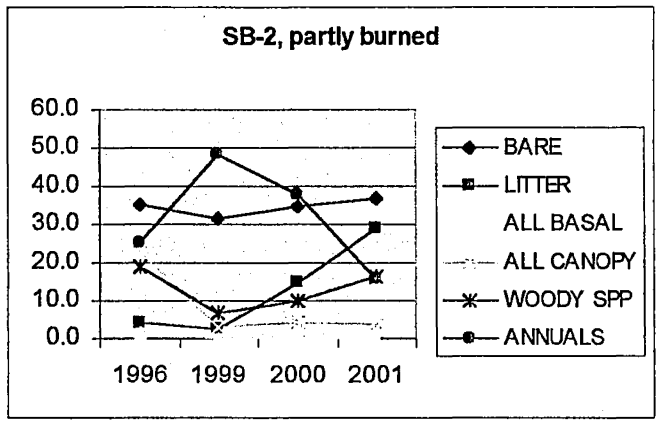
GW-9, Control	Means					t-test P		
	1996	1999	2000	2001		96-99	96-00	96-01
SOIL		33.6	43.6	40.7				
ROCK		0.6	0.1	0.5				
BARE	48.2	34.2	43.7	41.2		0.01	0.33	0.14
LITTER	10.5	12.5	13.1	9		0.28	0.17	0.44
PRGL	17.7	14.2	21.7	19.7		0.27	0.26	0.62
ANN FORB	6.4	9.1	0.6	5.1		0.06	0.00	0.39
BRDE	1.4	0	0	0		0.03	0.03	0.03
CRCO	2.4	1.3	1.3	0.7		0.03	0.01	0.00
ARIS BAS	2.2	2.3	3.8	4.5		0.88	0.09	0.00
ARIS CANOPY	9.8	20.9	16.3	16.5		0.00	0.01	0.00
ZIGR	1.2	2.1	1.3	0.4		0.08	0.84	0.09
SOEL	0.4	0	0.1	0		0.04	0.14	0.04
BOGR BAS	0.1	0	0	0.1		0.34	0.34	1.00
BOGR CAN	0.2	0	0.1	0.2		0.34	0.66	1.00
GUSA	0.6	2.2	1.6	2.3		0.01	0.02	0.02
ASTER	0.2	0.1	0	0		0.56	0.17	0.17
SPSP	0.2	0.1	0	0.1		0.56	0.17	0.56
MIBI	0.3	0.1	0	0.1		0.29	0.08	0.29
SCBR BAS	0	0.1	0	0.1		0.34		0.34
SCBR CAN	0.1	0.1	0	0		1.00	0.34	0.34
EVOL	0.4	0.2	0	0.2		0.36	0.04	0.36
BOCU BAS	0.2	0.1	0.3	0.5		0.56	0.70	0.39
BOCU CAN	0.6	1.1	1.1	1.5		0.41	0.47	0.09
MUPO BAS	0	0	0	0				
MUPO CAN	0.4	0	0.3	0		0.10	0.79	0.10
MUAR BAS	0	0	0.1	0.1			0.34	0.34
MUAR CAN	0.1	0	0.1	0.3		0.34	1.00	0.29
ANN GRAS	0.7	4.3	0.5	0		0.02	0.53	0.01
ERLE BAS	0	0	0	0.3				0.19
ERLE CAN	0.1	0	0.6	0.8		0.34	0.15	0.15
ISTE	0.2	0.1	0.2	0.2		0.66	1.00	1.00
HIMU BAS	0	0	0	0				
HIMU CAN	0.1	0	0	0		0.34	0.34	0.34
EPHEDRA	0.1	0.1	0	0.1		1.00	0.34	1.00
SEMA BAS	0	0.4	0.5	0.2		0.04	0.01	0.34
SEMA CAN	0.3	1.4	1.6	3.4		0.11	0.03	0.01
BOER BAS	0.1	0	0	0		0.34	0.34	0.34
BOER CAN	0.1	0.1	0	0.1		1.00	0.34	1.00
ERWR	0.2	1.5	0.3	0.7		0.01	0.63	0.23
ALL BASAL	2.6	2.9	4.7	5.8		0.71	0.06	0.00
ALL CANOPY	11.8	23.6	20.1	22.8	0	0.00	0.02	0.00
WOODY SPP	18	14.3	21.7	19.8	0	0.24	0.29	0.65
ANNUALS	7.1	13.4	1.1	5.1	0	0.00	0.00	0.17

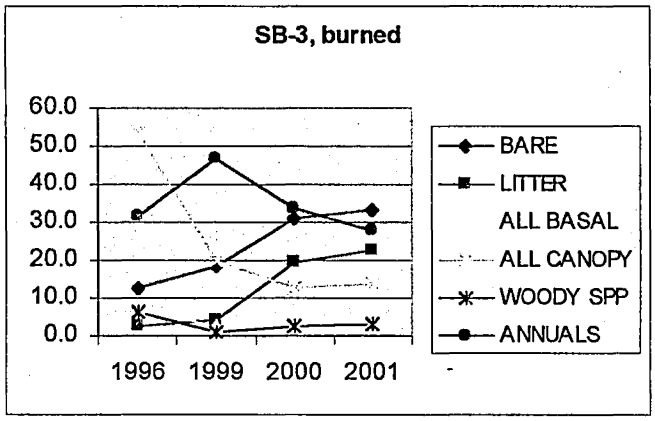
GW-10, Crush+seed	Means				t-test P		
	1996	1999	2000	2001	96-99	96-00	96-01
SOIL		43.4	53.5	38.7			
ROCK		0.2	0.5	0.2			
BARE	55.3	43.6	54	38.9	0.01	0.77	0.00
LITTER	13.4	9.3	9.7	10.4	0.01	0.04	0.04
PRGL	23	4.8	9.9	11.6	0.00	0.00	0.00
ANN FORB	2	16.8	1.1	8.5	0.00	0.21	0.00
CRCO	2.2	2.4	1.8	1.1	0.74	0.44	0.03
ARIS BAS	1	1.2	1.8	1.7	0.68	0.14	0.34
ARIS CANOPY	4.4	8.3	9.8	10.2	0.12	0.02	0.00
EVOL	0.1	0.1	0	0	1.00	0.34	0.34
PAOB BAS	0.1	0.1	0.1	0.1	1.00	1.00	1.00
PAOB CAN	0.2	0.2	0.6	0	1.00	0.25	0.34
ZIGR	0.3	1.1	0.7	0.5	0.11	0.30	0.47
BRDE	0.1	0	0	0	0.34	0.34	0.34
ANN GRAS	0.7	4.3	1.7	0.1	0.00	0.23	0.20
ERWR	0.2	0	0	0.3	0.17	0.17	0.70
SPWR BAS	0.1	0	0.1	0	0.34	1.00	0.34
SPWR CAN	0.2	0	0.2	0.4	0.34	1.00	0.51
MUAR BAS	0	0	0	0			
MUAR CAN	0.1	0	0	0.1	0.34	0.34	1.00
ISTE	0.1	0	0	0.1	0.34	0.34	1.00
GUSA	0.1	0.1	0.1	0.4	1.00	1.00	0.14
SEMA BAS	0	1	2.7	2	0.02	0.00	0.00
SEMA CAN	0.3	6.5	8.7	9.3	0.00	0.00	0.00
SPFL CAN	0.1	0	0	0	0.34	0.34	0.34
SOEL	0.1	0	0.2	0	0.34	0.56	0.34
BOCU CAN	0.1	0.3	0.9	2.3	0.41	0.03	0.00
DICA CAN	0.1	0.3	0.5	0.2	0.29	0.13	0.56
DICA BAS			0.2	0.1			
ERLE BAS				0.2			
ERLE CAN				3.8			
ERIN BAS				0.5			
ERIN CAN				4.5			
BOGR BAS				0.1			
BOGR CAN				2.6			
ALL BASAL	1.2	2.3	4.9	4.7	0.16	0.00	0.01
ALL CANOPY	5.2	15	19.3	31.1	0.00	0.00	0.00
WOODY SPP	23	4.8	9.9	11.6	0.00	0.00	0.00
ANNUALS	2.7	21.1	2.8	8.6	0.00	0.93	0.00

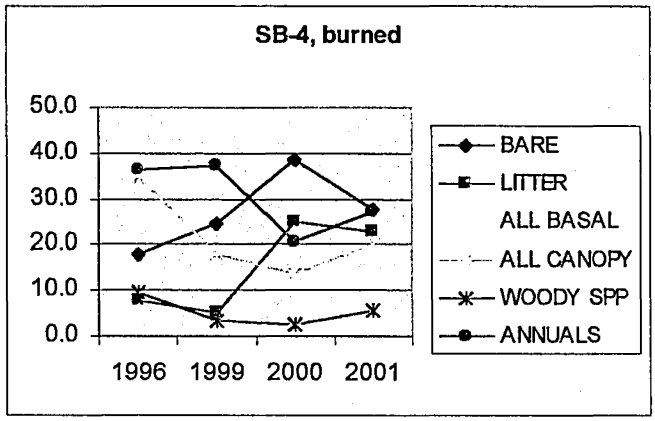
GW-11, Crush only	Means				t-test P		
	1996	1999	2000	2001	96-99	96-00	96-01
SOIL		53.8	61.7	43.8			
ROCK		0.5	0.4	0.1			
BARE	66.1	54.3	62.1	43.9	0.03	0.42	0.00
LITTER	9.0	5.2	6.4	7.5	0.09	0.34	0.47
PRGL	8.0	2.0	5.0	4.7	0.00	0.02	0.01
ANN FORB	2.0	21.3	3.1	14.0	0.00	0.29	0.00
ANN GRAS	0.6	2.1	4.1	0.0	0.12	0.00	0.11
TAAU	0.5	0.0	0.0	0.4	0.05	0.05	0.75
SCBR BAS	1.2	0.2	0.6	1.2	0.04	0.22	1.00
SCBR CAN	2.2	1.1	0.9	0.5	0.23	0.13	0.05
ARIS BAS	0.5	0.5	1.5	3.3	1.00	0.11	0.01
ARIS CAN	2.8	4.7	8.1	18.2	0.34	0.04	0.00
BOGR BAS	0.5	0.1	0.1	0.8	0.13	0.13	0.54
BOGR CAN	0.7	0.1	0.2	1.4	0.12	0.19	0.35
GUSA	0.4	0.5	0.2	0.6	0.72	0.36	0.48
PAOB BAS	0.4	0.4	0.5	1.4	1.00	0.78	0.15
PAOB CAN	2.7	3.6	4.0	4.4	0.58	0.40	0.28
MUAR BAS	0.5	0.0	0.4	0.6	0.05	0.75	0.81
MUAR CAN	1.1	0.3	0.7	0.7	0.15	0.52	0.46
BOER BAS	0.1	0.2	0.1	0.7	0.56	1.00	0.17
BOER CAN	0.5	0.7	0.0	1.1	0.87	0.18	0.35
EVOL	0.8	0.0	0.3	0.2	0.07	0.32	0.17
CRCO	2.5	1.8	1.4	1.6	0.35	0.18	0.23
SEMA BAS	0.0	0.2	0.6	0.2	0.17	0.08	0.34
SEMA CAN	0.1	1.0	1.8	1.0	0.06	0.07	0.06
ZIGR	0.2	0.5	0.3	0.2	0.27	0.70	1.00
DAPU CAN	0.1	0.0	0.1	0.5	0.34	1.00	0.19
SPSP	0.2	0.4	0.0	0.4	0.36	0.17	0.36
ASTER	0.1	0.0	0.0	0.0	0.35	0.35	0.35
ISTE	0.5	0.5	0.3	0.3	1.00	0.57	0.60
DICA CAN	0.1	0.1	0.0	1.1	1.00	0.34	0.06
ALL BASAL	3.2	1.6	3.8	8.2	0.18	0.62	0.02
ALL CANOPY	10.1	11.4	15.7	27.3	0.74	0.13	0.00
WOODY SPP	8.0	2.0	3.5	4.7	0.00	0.02	0.01
ANNUALS	2.6	23.4	7.2	14.0	0.00	0.00	0.00

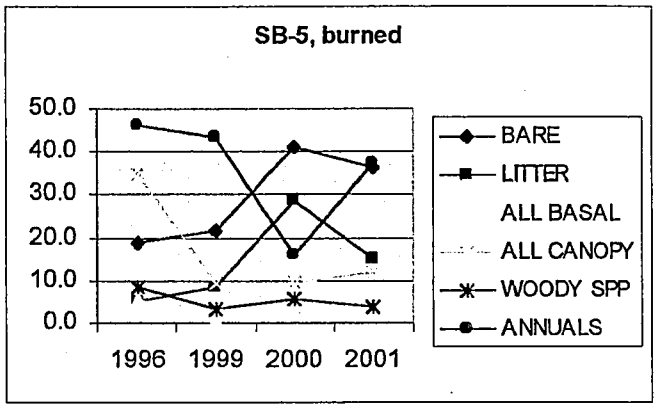
GW-12, Crush+seed	Means				t-test P		
	1996	1999	2000	2001	96-99	96-00	96-01
SOIL		45.8	63.3	37.2			
ROCK		0.3	1.0	0.6			
BARE	63.5	46.1	64.3	37.8	0.00	0.86	0.00
LITTER	11.7	7.2	11.5	6.9	0.07	0.93	0.06
PRGL	5.7	2.9	3.6	3.7	0.06	0.14	0.12
ANN FORB	1.0	12.6	0.1	13.4	0.00	0.00	0.00
ARIS BAS	1.3	1.2	2.8	4.0	0.84	0.08	0.00
ARIS CAN	6.9	10.0	10.1	14.7	0.18	0.12	0.00
BOER BAS	0.8	0.2	0.3	0.3	0.11	0.15	0.15
BOER CAN	1.6	0.9	1.0	1.8	0.25	0.37	0.83
CRCO	3.9	4.2	1.5	3.1	0.75	0.00	0.27
MUAR BAS	0.3	0.1	0.1	0.1	0.41	0.41	0.41
MUAR CAN	1.0	0.9	0.5	1.2	0.86	0.34	0.75
PAOB BAS	0.5	1.7	1.3	2.1	0.05	0.14	0.00
PAOB CAN	2.9	9.8	4.9	7.0	0.00	0.11	0.01
SCBR BAS	0.9	0.3	0.0	1.0	0.38	0.19	0.90
SCBR CAN	1.2	1.2	0.4	0.7	1.00	0.35	0.54
ZIGR	0.4	1.0	0.3	0.4	0.07	0.71	1.00
ISTE	0.4	0.1	0.0	0.0	0.14	0.04	0.04
TAAU	0.1	0.0	0.0	0.0	0.34	0.34	0.34
EVOL	0.7	0.9	0.4	0.3	0.63	0.34	0.21
HIMU BAS	0.1	0.2	0.2	0.0	0.66	0.66	0.34
HIMU CAN	0.1	0.3	0.2	0.0	0.54	0.66	0.34
GUSA	0.2	0.1	0.0	0.4	0.56	0.17	0.45
ERLE BAS	0.1	0.0	0.0	0.5	0.34	0.34	0.13
ERLE CAN	0.1	0.0	0.0	1.6	0.34	0.34	0.11
ERIN BAS				0.3			
ERIN CAN				2.5			
BOGR BAS				0.2			
BOGR CAN				2.3			
ANN GRASS	0.1	0.6	0.2	0.2	0.15	0.66	0.66
SEMA BAS			0.4	0.8			
SEMA CAN			1.3	3.2			
PAN SP				0.6			
BOCU BAS				0.0			
BOCU CAN				0.8			
ALL BASAL	4.0	3.7	5.1	9.2	0.86	0.56	0.01
ALL CANOPY	13.8	23.1	18.4	35.8	0.00	0.11	0.00
WOODY SPP	5.7	2.9	3.6	3.7	0.06	0.14	0.12
ANNUALS	1.1	13.2	0.3	13.6	0.00	0.05	0.00

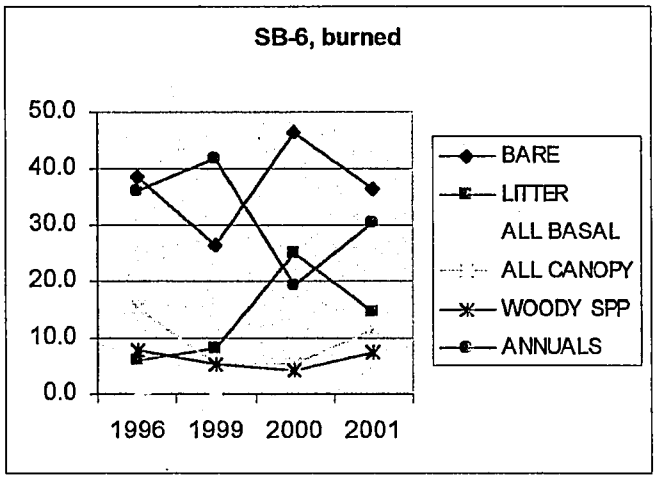

SB-1, unburned
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0.0
1996
1999
2000
2001
BARE
LITTER
ALL BASAL
ALL CANOPY
WOODY SPP
ANNUALS

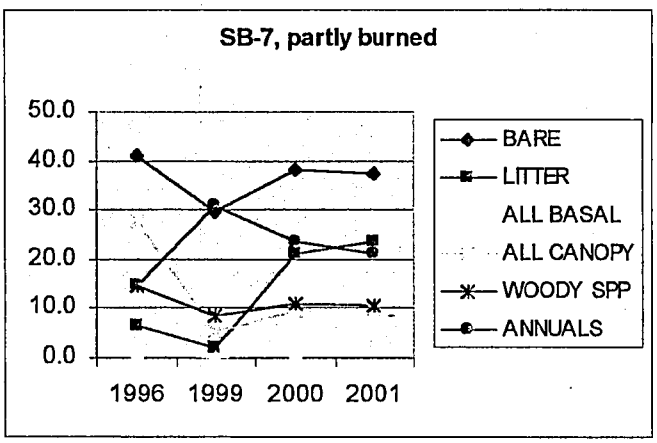

SB-2, partly burned
60.0
50.0
40.0
30.0
20.0
10.0
0.0
1996
1999
2000
2001
BARE
LITTER
ALL BASAL
ALL CANOPY
WOODY SPP
ANNUALS

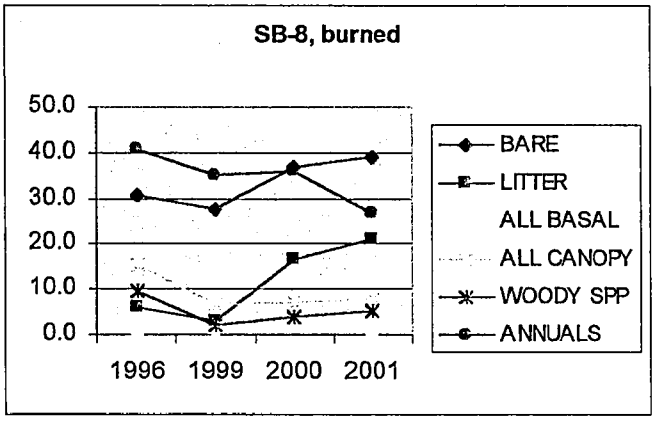

SB-3, burned
60.0
50.0
40.0
30.0
20.0
10.0
0.0
1996
1999
2000
2001
BARE
LITTER
ALL BASAL
ALL CANOPY
WOODY SPP
ANNUALS

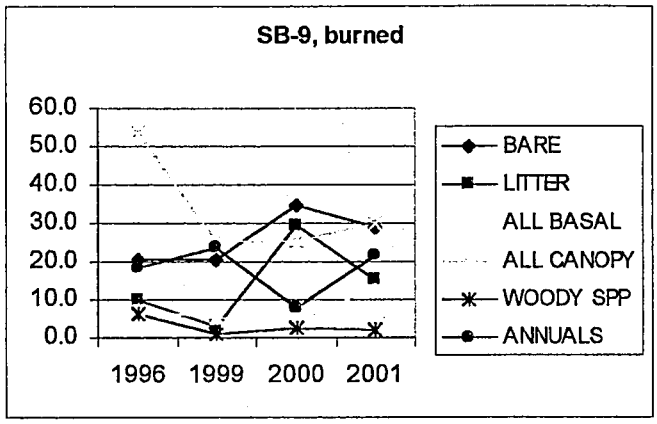

SB-4, burned
50.0
40.0
30.0
20.0
10.0
0.0
1996
1999
2000
2001
BARE
LITTER
ALL BASAL
ALL CANOPY
WOODY SPP
ANNUALS

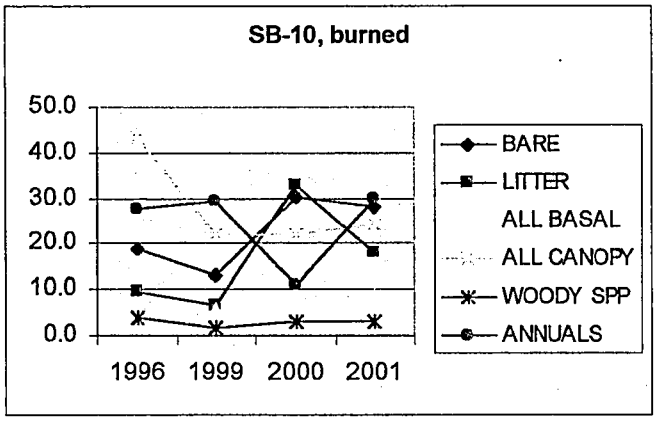

SB-5, burned
50.0
40.0
30.0
20.0
10.0
0.0
1996 1999 2000 2001
BARE
LITTER
ALL BASAL
ALL CANOPY
WOODY SPP
ANNUALS

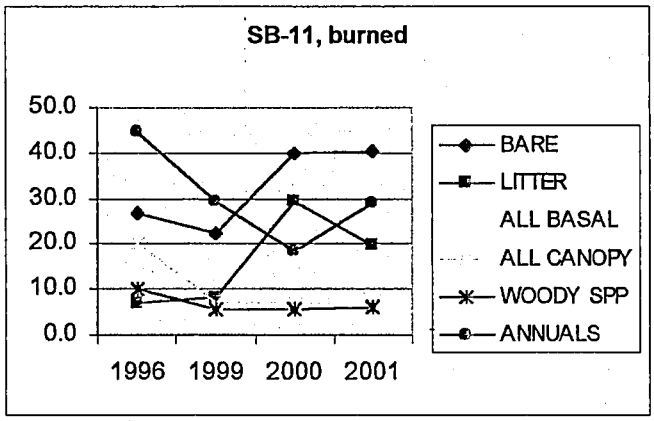

SB-6, burned
50.0
40.0
30.0
20.0
10.0
0.0
1996 1999 2000 2001
BARE
LITTER
ALL BASAL
ALL CANOPY
WOODY SPP
ANNUALS

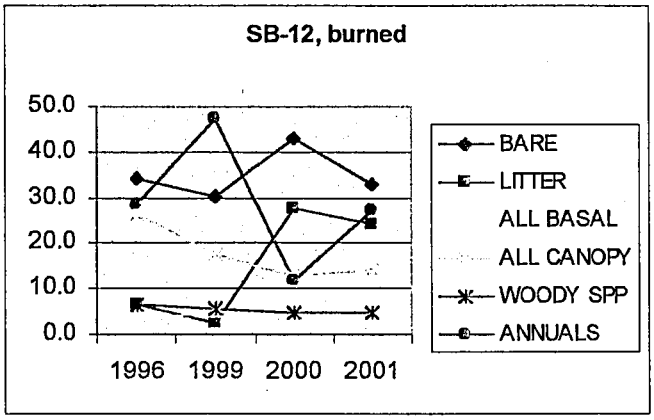

SB-7, partly burned
50.0
40.0
30.0
20.0
10.0
0.0
1996 1999 2000 2001
BARE
LITTER
ALL BASAL
ALL CANOPY
WOODY SPP
ANNUALS


SB-8, burned
50.0
40.0
30.0
20.0
10.0
0.0
1996 1999 2000 2001
BARE
LITTER
ALL BASAL
ALL CANOPY
WOODY SPP
ANNUALS


SB-9, burned
60.0
50.0
40.0
30.0
20.0
10.0
0.0
1996
1999
2000
2001
BARE
LITTER
ALL BASAL
ALL CANOPY
WOODY SPP
ANNUALS


SB-10, burned
50.0
40.0
30.0
20.0
10.0
0.0
1996
1999
2000
2001
BARE
LITTER
ALL BASAL
ALL CANOPY
WOODY SPP
ANNUALS


SB-11, burned
50.0
40.0
30.0
20.0
10.0
0.0
1996
1999
2000
2001
BARE
LITTER
ALL BASAL
ALL CANOPY
WOODY SPP
ANNUALS


SB-12, burned
50.0
40.0
30.0
20.0
10.0
0.0
1996
1999
2000
2001
BARE
LITTER
ALL BASAL
ALL CANOPY
WOODY SPP
ANNUALS

SB-1, unburned	Means				t-test P		
	1996	1999	2000	2001	96-99	96-00	96-01
SOIL		58.5	55.7	53.2			
ROCK		3.8	6.0	4.1			
BARE	62.2	62.3	61.7	57.3	0.99	0.93	0.46
LITTER	5.3	3.0	10.8	13.2	0.06	0.02	0.01
TARBUSH	6.7	7.7	7.9	8.2	0.62	0.40	0.41
ARIS CAN	6.7	1.5	1.5	1.2	0.01	0.00	0.00
GUSA	6.6	8.7	1.3	2.1	0.55	0.00	0.01
MUPO CAN	5.7	4.3	2.7	1.9	0.58	0.06	0.02
PRGL	5.3	4.5	5.4	7.0	0.65	0.93	0.29
WHTHORN	3.8	5.0	6.1	6.0	0.49	0.18	0.19
ANN GRAS	1.7	4.3	3.7	0.0	0.16	0.16	0.04
FORB	1.0	3.5	1.3	6.4	0.11	0.62	0.00
SEMA CAN		0.8	0.3	1.8			
HIMU CAN		1.0	0.0	0.7			
SOEL				0.2			
PAOB CAN				0.1			
BOBA CAN				0.2			
ALL BASAL							
ALL CANOPY	12.4	4.6	4.5	5.9	0.02	0.01	0.04
WOODY SPP	15.8	10.3	19.4	21.2	0.14	0.17	0.12
ANNUALS	2.7	4.7	5.0	6.4	0.35	0.18	0.03

SB-2, Partly burned	Means				t-test P		
	1996	1999	2000	2001	96-99	96-00	96-01
SOIL		27.6	29.7	33.4			
ROCK		3.8	5.2	3.5			
BARE	35.1	31.4	34.9	36.9	0.36	0.96	0.64
LITTER	4.2	2.6	14.9	29.1	0.11	0.00	0.00
FORB	2.9	17.9	2.3	15.6	0.00	0.57	0.00
PRGL	2.9	2.0	1.7	3.5	0.38	0.19	0.63
ANN GRAS	22.4	42.5	35.5	0.4	0.00	0.00	0.00
GUSA	4.8	0.8	0.4	1.3	0.00	0.00	0.01
ARIS BAS	1.7	0.1	0.1	0.0	0.01	0.01	0.01
ARIS CAN	21.0	3.6	3.4	1.6	0.00	0.00	0.00
MUPO CAN	1.6	0.0	0.0	0.1	0.00	0.00	0.00
WHTHORN	16.0	6.5	8.3	12.7	0.00	0.00	0.07
HIMU CAN			0.7	0.8			
HODE				0.6			
SEMA CAN				0.7			
BOBA CAN				0.3			
ALL BASAL	1.7	0.1	0.1	0.0	0.01	0.01	0.01
ALL CANOPY	22.6	2.9	4.1	3.5	0.00	0.00	0.00
WOODY SPP	18.9	6.8	10.0	16.2	0.00	0.00	0.22
ANNUALS	25.3	48.3	37.8	16.0	0.03	0.00	0.01

SB-3, burned	Means				t-test P		
	1996	1999	2000	2001	96-99	96-00	96-01
SOIL		15.3	21.3	26.8			
ROCK		3.1	9.7	6.1			
BARE	12.6	18.4	31.0	32.9	0.02	0.00	0.00
LITTER	2.5	4.0	19.7	22.7	0.18	0.00	0.00
FORB	2.0	21.3	0.4	24.0	0.00	0.02	0.00
PRGL	1.4	0.9	1.7	1.5	0.30	0.57	0.84
ANN GRAS	29.4	39.4	33.9	3.8	0.00	0.17	0.00
WHTHORN	5.0	0.5	0.6	1.7	0.00	0.00	0.01
GUSA	1.6	0.1	0.0	0.1	0.00	0.00	0.00
ARIS BAS	4.5	0.4	0.1	0.4	0.00	0.00	0.00
ARIS CAN	44.2	9.6	2.7	3.9	0.00	0.00	0.00
HIMU BAS	2.5	3.1	3.1	3.4	0.51	0.61	0.48
HIMU CAN	9.0	14.1	8.9	9.8	0.09	0.97	0.81
HODE				1.1			
ALL BASAL	7.3	2.9	3.4	3.8	0.00	0.00	0.01
ALL CANOPY	53.7	19.8	12.7	13.7	0.00	0.00	0.00
WOODY SPP	6.3	1.0	2.5	3.2	0.00	0.00	0.01
ANNUALS	31.4	46.7	33.7	27.8	0.09	0.48	0.20

SB-4, burned	Means				t-test P		
	1996	1999	2000	2001	96-99	96-00	96-01
SOIL		20.0	27.4	20.4			
ROCK		4.8	11.3	7.2			
BARE	17.9	24.8	38.7	27.6	0.09	0.00	0.00
LITTER	7.9	5.3	24.9	22.8	0.14	0.00	0.00
FORB	10.4	14.0	0.9	18.6	0.05	0.00	0.00
PRGL	2.9	2.4	0.8	2.4	0.62	0.06	0.69
ANN GRAS	26.0	32.5	19.6	8.6	0.24	0.24	0.00
WHTHORN	6.7	1.8	1.9	3.2	0.00	0.00	0.01
ARIS BAS	1.0	0.0	0.3	0.2	0.03	0.12	0.08
ARIS CAN	9.4	0.6	0.5	1.9	0.00	0.00	0.01
HIMU BAS	4.8	3.8	3.1	5.2	0.45	0.18	0.76
HIMU CAN	22.9	18.9	13.0	16.3	0.38	0.03	0.11
PAOB CAN	2.4	3.0	0.1	1.7	0.77	0.05	0.57
SEDGE		2.4	0.0	0.8			
HODE				1.3			
HIBE CAN				0.2			
ALL BASAL	5.8	3.0	3.4	5.4	0.04	0.05	0.75
ALL CANOPY	34.7	18.0	13.6	20.1	0.01	0.00	0.00
WOODY SPP	9.6	3.3	2.7	5.6	0.00	0.00	0.01
ANNUALS	36.4	37.2	20.5	27.2	0.92	0.01	0.08

SB-5, burned

	Means				t-test P		
	1996	1999	2000	2001	96-99	96-00	96-01
SOIL		19.8	37.0	33.5			
ROCK		2.1	4.0	2.7			
BARE	18.7	21.9	41.0	36.2	0.35	0.00	0.01
LITTER	5.2	8.5	29.0	15.2	0.33	0.00	0.00
FORB	19.3	20.3	1.9	18.8	0.82	0.00	0.91
PRGL	2.1	0.5	1.1	0.7	0.01	0.11	0.02
ANN GRAS	26.7	34.0	14.1	18.5	0.04	0.00	0.03
ARIS BAS	2.8	0.0	0.2	0.1	0.00	0.01	0.01
ARIS CAN	17.0	1.3	2.6	2.8	0.00	0.00	0.00
WHTHORN	6.6	3.6	4.6	3.3	0.07	0.23	0.06
LEDU CAN	1.2	0.0	0.0	0.0	0.04	0.04	0.04
PAOB BAS	0.0	0.3	0.4	1.4	0.17	0.22	0.06
PAOB CAN	3.5	2.9	1.6	3.3	0.76	0.34	0.93
HIMU BAS	2.8	1.1	1.5	1.4	0.19	0.33	0.29
HIMU CAN	13.3	7.4	5.4	5.8	0.29	0.17	0.20
SEDGE		3.9	0.0	0.7			
SOEL		1.8	0.0	0.6			
HODE		0.9	0.0	0.2			
BOBA CAN				0.1			
ALL BASAL	5.6	1.1	2.1	2.9	0.01	0.03	0.11
ALL CANOPY	35.0	9.2	9.6	12.0	0.00	0.00	0.00
WOODY SPP	8.7	3.3	5.7	4.0	0.01	0.13	0.02
ANNUALS	46.0	43.4	16.0	37.3	0.78	0.00	0.18

SB-6, burned

	Means				t-test P		
	1996	1999	2000	2001	96-99	96-00	96-01
SOIL		23.1	36.8	30.8			
ROCK		3.4	9.5	5.7			
BARE	38.5	26.5	46.3	36.5	0.01	0.03	0.64
LITTER	6.2	8.3	24.9	14.7	0.33	0.00	0.00
FORB	5.7	13.5	0.7	12.8	0.01	0.00	0.00
PRGL	0.9	1.0	0.5	0.9	0.87	0.28	1.00
ANN GRAS	30.2	38.9	18.5	17.5	0.03	0.00	0.00
ARIS CAN	4.7	0.3	0.3	1.2	0.00	0.00	0.01
WHTHORN	7.0	5.5	3.9	6.5	0.36	0.05	0.78
SEDGE	1.4	9.0	0.0	2.3	0.00	0.02	0.30
HIMU BAS	0.0	1.3	1.7	3.6	0.03	0.03	0.06
HIMU CAN	8.0	6.1	4.6	9.7	0.37	0.07	0.70
PAOB CAN	2.6	0.1	0.5	0.6	0.03	0.05	0.06
HODE				0.8			
ALL BASAL	0.0	1.0	1.7	3.6	0.03	0.03	0.06
ALL CANOPY	15.3	5.2	5.4	11.5	0.00	0.00	0.38
WOODY SPP	7.9	5.2	4.4	7.4	0.16	0.04	0.78
ANNUALS	35.9	41.9	19.2	30.3	0.45	0.00	0.19

SB-7, partly burned	Means				t-test P		
	1996	1999	2000	2001	96-99	96-00	96-01
SOIL		27.5	34.7	33.8			
ROCK		2.2	3.6	3.6			
BARE	40.9	29.7	38.3	37.4	0.13	0.62	0.50
LITTER	6.6	2.2	21.1	23.6	0.00	0.00	0.00
ARIS BAS			0.7	0.2			
ARIS CAN	11.9	2.7	3.2	1.7	0.00	0.00	0.00
PRGL	7.9	5.8	5.9	4.6	0.18	0.16	0.01
FORB	7.5	41.5	11.2	20.8	0.01	0.13	0.00
ANN GRAS	7.1	9.8	12.3	0.3	0.38	0.23	0.00
WHTHORN	6.7	8.7	5.1	6.1	0.59	0.43	0.81
DICA BAS	1.4	0.0	0.0		0.04	0.04	
DICA CAN	5.6	0.3	0.5	0.0	0.02	0.03	0.02
MUPO CAN	4.1	2.3	1.5	0.7	0.19	0.03	0.00
GUSA	2.5	5.3	0.3	0.6	0.33	0.02	0.04
PAOB CAN	2.3	1.5	4.1	4.1	0.51	0.45	0.32
HIMU BAS			0.7	1.6			
HIMU CAN	2.2	1.5	2.8	3.4	0.66	0.72	0.58
SEMA CAN	1.6	0.7	0.0	0.1	0.18	0.02	0.03
SOEL				1.0			
HODE				1.8			
ALL BASAL	1.4	0.0	1.4	1.8	0.04	1.00	0.72
ALL CANOPY	27.7	5.4	9.4	9.6	0.00	0.00	0.00
WOODY SPP	14.6	8.7	11.0	10.7	0.10	0.18	0.17
ANNUALS	14.6	30.8	23.5	21.1	0.16	0.07	0.06

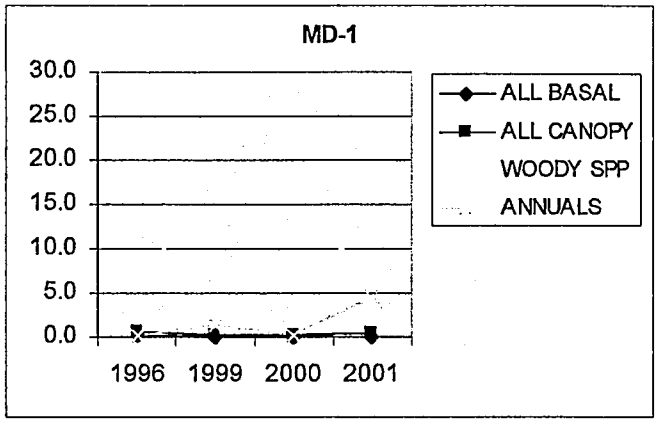
SB-8, burned	Means				t-test P		
	1996	1999	2000	2001	96-99	96-00	96-01
SOIL		22.7	30.8	34.5			
ROCK		4.8	6.1	4.5			
BARE	30.8	27.5	36.9	39.0	0.46	0.16	0.02
LITTER	6.1	3.0	16.5	21.1	0.00	0.00	0.00
ANN GRAS	34.8	42.8	34.9	8.2	0.18	0.98	0.00
ARIS CAN	7.8	1.7	1.7	1.0	0.00	0.00	0.00
HIMU CAN	7.7	9.3	5.1	6.3	0.58	0.37	0.65
WHTHORN	7.5	3.0	2.7	3.8	0.02	0.01	0.04
FORB	6.2	16.0	1.1	18.5	0.01	0.01	0.00
GUSA	2.6	0.3	0.3	0.1	0.05	0.05	0.03
PRGL	2.3	0.7	1.4	1.3	0.05	0.25	0.20
HIMU BAS	1.4	1.0	2.0	1.3	0.50	0.46	0.88
HODE				0.2			
PAOB CAN				0.3			
SEMA CAN				0.1			
SEDGE				0.4			
ALL BASAL	1.4	0.6	2.0	1.3	0.18	0.46	0.88
ALL CANOPY	15.5	6.6	6.8	7.7	0.01	0.01	0.02
WOODY SPP	9.8	2.2	4.1	5.1	0.00	0.00	0.01
ANNUALS	41.0	35.3	36.0	26.7	0.59	0.28	0.00

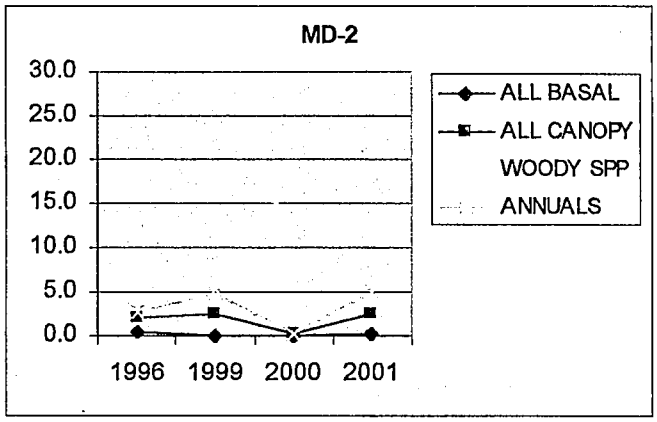
SB-9, burned	Means				t-test P		
	1996	1999	2000	2001	96-99	96-00	96-01
SOIL		19.7	31.7	26.2			
ROCK		1.0	3.2	2.5			
BARE	20.5	20.7	34.9	28.7	0.95	0.00	0.01
LITTER	9.9	3.3	29.7	15.3	0.00	0.00	0.01
HIMU CAN	32.3	31.0	24.0	23.4	0.86	0.11	0.03
PAOB CAN	19.7	10.2	1.1	6.0	0.11	0.00	0.00
ANN GRAS	13.5	24.5	7.4	5.1	0.00	0.01	0.00
ANN FORB	4.9	14.7	0.4	16.6	0.00	0.00	0.00
HIMU BAS	4.8	7.5	5.3	9.6	0.24	0.72	0.01
PRGL	3.6	1.0	1.3	1.1	0.00	0.00	0.00
WHTHORN	2.7	1.2	1.2	1.0	0.12	0.09	0.05
PAOB BAS	2.6	1.2	0.2	3.0	0.17	0.00	0.68
ARIS CAN	1.4	0.7	0.3	0.7	0.28	0.09	0.27
SPWR CAN	0.2	0.0	0.0	0.0	0.17	0.17	0.17
ARIS BAS	0.1	0.3	0.0	0.0	0.35	0.34	0.34
SPWR BAS	0.1	0.0	0.0	0.0	0.34	0.34	0.34
SEDGE		3.8	0.0	0.3			
HODE				2.3			
SOEL				0.5			
ALL BASAL	7.6	5.4	5.5	12.6	0.32	0.15	0.03
ALL CANOPY	53.6	25.1	25.4	30.1	0.00	0.00	0.00
WOODY SPP	6.3	1.3	2.5	2.1	0.00	0.00	0.00
ANNUALS	18.4	23.5	7.8	21.7	0.46	0.00	0.10

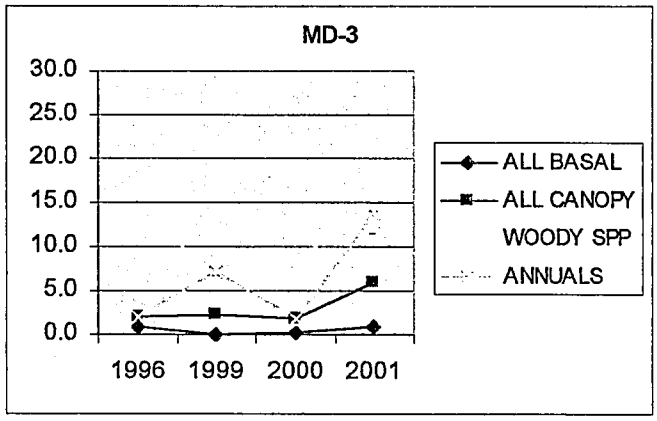
SB-10, burned	Means				t-test P		
	1996	1999	2000	2001	96-99	96-00	96-01
SOIL		12.2	27.1	25.8			
ROCK		0.8	3.2	2.3			
BARE	18.8	13.0	30.3	28.1	0.39	0.05	0.19
LITTER	9.5	6.5	32.8	17.8	0.21	0.00	0.00
HIMU CAN	24.9	23.5	19.8	15.2	0.87	0.44	0.12
ANN GRAS	18.3	27.0	8.8	8.8	0.03	0.01	0.01
PAOB CAN	9.5	12.3	2.1	7.2	0.55	0.02	0.50
FORB	9.2	22.2	2.1	20.9	0.02	0.02	0.00
ARIS CAN	9.0	0.5	0.2	1.9	0.00	0.00	0.00
HIMU BAS	4.1	7.3	8.1	5.8	0.29	0.11	0.45
WHTHORN	2.4	2.3	1.9	1.7	0.96	0.70	0.52
PRGL	1.6	0.7	1.1	1.3	0.08	0.34	0.64
ARIS BAS	1.4	0.2	0.0	0.2	0.01	0.01	0.02
PAOB BAS	1.4	1.8	1.1	2.7	0.73	0.74	0.28
SEDGE		5.7	0.0	0.4			
SOEL		1.0	0.0	0.2			
HODE		1.3	0.0	1.0			
ALL BASAL	6.9	5.6	9.2	8.7	0.62	0.44	0.48
ALL CANOPY	43.4	21.8	22.1	24.3	0.02	0.00	0.01
WOODY SPP	4.0	1.8	3.0	3.0	0.14	0.50	0.47
ANNUALS	27.5	29.5	10.9	29.7	0.84	0.00	0.69

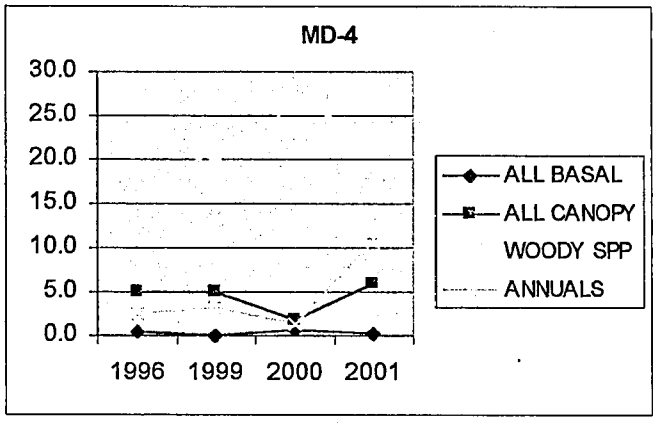
SB-11, burned	Means				t-test P		
	1996	1999	2000	2001	96-99	96-00	96-01
SOIL		19.2	33.6	35.9			
ROCK		3.0	6.2	4.6			
BARE	26.6	22.2	39.8	40.5	0.40	0.01	0.04
LITTER	7.1	8.3	29.6	19.6	0.48	0.00	0.00
FORB	12.6	18.3	2.0	20.2	0.06	0.00	0.04
PRGL	1.6	1.8	1.4	1.4	0.79	0.73	0.72
ANN GRAS	32.2	31.0	16.6	8.8	0.82	0.00	0.00
HIMU BAS	3.3	3.0	2.0	2.2	0.84	0.12	0.21
HIMU CAN	12.6	9.8	6.7	6.0	0.48	0.06	0.04
PAOB CAN	4.9	0.8	0.0	0.6	0.14	0.08	0.11
ARIS CAN	2.8	1.0	0.3	0.1	0.04	0.01	0.00
WHTHORN	8.3	7.3	4.2	4.8	0.59	0.04	0.06
SEDGE		9.2	0.0	1.1			
HODE				0.7			
ALL BASAL	3.3	1.8	2.0	2.2	0.19	0.12	0.21
ALL CANOPY	20.3	7.0	7.0	6.7	0.01	0.01	0.01
WOODY SPP	9.9	5.5	5.6	6.2	0.06	0.05	0.07
ANNUALS	44.8	29.6	18.6	29.0	0.13	0.00	0.01

SB-12, burned	Means				t-test P		
	1996	1999	2000	2001	96-99	96-00	96-01
SOIL		25.3	31.2	27.7			
ROCK		4.8	12.0	5.0			
BARE	34.2	30.2	43.2	32.7	0.56	0.18	0.82
LITTER	6.7	2.8	27.7	24.1	0.03	0.00	0.00
ANN FORB	9.0	6.8	0.0	9.3	0.29	0.00	0.90
ANN GRAS	19.7	40.5	11.8	17.8	0.00	0.02	0.59
WHTHORN	6.5	5.5	4.8	4.9	0.59	0.34	0.37
HIMU BAS	3.2	5.2	2.5	4.4	0.35	0.43	0.34
HIMU CAN	26.4	17.7	12.0	13.6	0.36	0.08	0.11
PAOB CAN			0.7	0.0			
ARIS CAN				0.4			
SEDGE		1.8		1.8			
HODE				0.1			
ALL BASAL	3.2	5.2	2.5	4.4	0.95	0.43	0.34
ALL CANOPY	26.4	17.7	12.7	14.0	0.07	0.09	0.12
WOODY SPP	6.5	5.5	4.8	4.9	0.06	0.34	0.37
ANNUALS	28.7	47.3	11.8	27.1	0.97	0.00	0.75


MD-1
30.0
25.0
20.0
15.0
10.0
5.0
0.0
1996
1999
2000
2001
ALL BASAL
ALL CANOPY
WOODY SPP
ANNUALS


MD-2
30.0
25.0
20.0
15.0
10.0
5.0
0.0
1996
1999
2000
2001
ALL BASAL
ALL CANOPY
WOODY SPP
ANNUALS


MD-3
30.0
25.0
20.0
15.0
10.0
5.0
0.0
1996
1999
2000
2001
ALL BASAL
ALL CANOPY
WOODY SPP
ANNUALS


MD-4
30.0
25.0
20.0
15.0
10.0
5.0
0.0
1996
1999
2000
2001
ALL BASAL
ALL CANOPY
WOODY SPP
ANNUALS

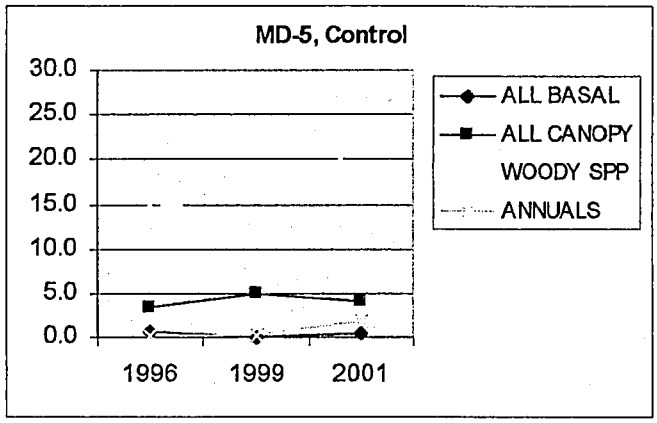

MD-5, Control
30.0
25.0
20.0
15.0
10.0
5.0
0.0
1996
1999
2001
ALL BASAL
ALL CANOPY
WOODY SPP
ANNUALS

Table 5. Comparison of cover data, 1996-2001, McDonald site.

MD-1	Means				t-test P		
	1996	1999	2000	2001	96-99	96-00	96-01
SOIL		51.6	67.9	62.3			
ROCK		2.1	4.1	2.1			
BARE	81.3	53.7	72.0	64.4	0.00	0.02	0.00
LITTER	5.7	35.6	18.3	19.5	0.00	0.00	0.00
ANN FORB	0.1	1.3	0.2	3.9	0.09	0.56	0.01
PRGL	11.1	6.1	7.7	10.9	0.05	0.19	0.94
ANN GRAS	0.1	0.1	0.0	0.6	1.00	0.34	0.15
GUSA	1.3	0.4	0.0	0.2	0.13	0.03	0.06
XMAS	0.1	0.0	0.0	0.0	0.34	0.34	0.34
MUPO BAS	0.0	0.0	0.0	0.0			
MUPO CAN	0.2	0.1	0.0	0.0	0.56	0.17	0.17
HIMU BAS	0.2	0.0	0.0	0.0	0.34	0.34	0.34
HIMU CAN	0.4	0.2	0.2	0.5	0.56	0.56	0.81
PPEAR	0.1	0.6	0.4	0.2	0.35	0.24	0.56
4WING	0.2	1.1	0.5	0.2	0.06	0.18	1.00
ALL BASAL	0.2	0.0	0.0	0.0	0.34	0.34	0.34
ALL CANOPY	0.6	0.3	0.2	0.5	0.43	0.25	0.81
WOODY SPP	11.4	7.2	8.2	11.1	0.10	0.23	0.91
ANNUALS	0.2	1.4	0.2	4.5	0.09	1.00	0.00

MD-2	Means				t-test P		
	1996	1999	2000	2001	96-99	96-00	96-01
SOIL		54.9	58.9	53.0			
ROCK		6.3	5.7	5.6			
BARE	75.4	61.2	64.6	58.6	0.00	0.04	0.01
LITTER	5.2	20.4	17.8	17.6	0.00	0.01	0.01
ANN FORB	0.3	1.3	0.2	3.4	0.07	0.63	0.04
PRGL	13.6	12.1	16.0	16.6	0.37	0.28	0.22
ANN GRAS	2.4	3.4	0.0	1.5	0.57	0.06	0.49
GUSA	1.9	0.8	0.0	0.1	0.16	0.02	0.03
SPWR BAS	0.4	0.0	0.0	0.2	0.10	0.10	0.45
SPWR CAN	1.0	1.6	0.1	1.6	0.30	0.09	0.44
SEMA BAS	0.0	0.0	0.0	0.1			0.34
SEMA CAN	0.4	0.8	0.2	0.8	0.29	0.45	0.29
MUPO BAS	0.0	0.0	0.0	0.0			
MUPO CAN	0.7	0.2	0.0	0.2	0.22	0.07	0.19
MIBI	0.1	0.1	0.0	0.0	1.00	0.34	0.34
TARBUSH	0.1	0.0	0.0	0.0	0.34	0.34	0.34
P PEAR				0.3			
CRUX THORN				0.3			
ALL BASAL	0.4	0.0	0.0	0.3	0.10	0.10	0.71
ALL CANOPY	2.1	2.6	0.3	2.6	0.34	0.00	0.47
WOODY SPP	13.7	12.1	16.0	16.9	0.34	0.30	0.21
ANNUALS	2.7	4.7	0.2	4.9	0.34	0.06	0.31

Table 5. Comparison of cover data, 1996-2001, McDonald site.

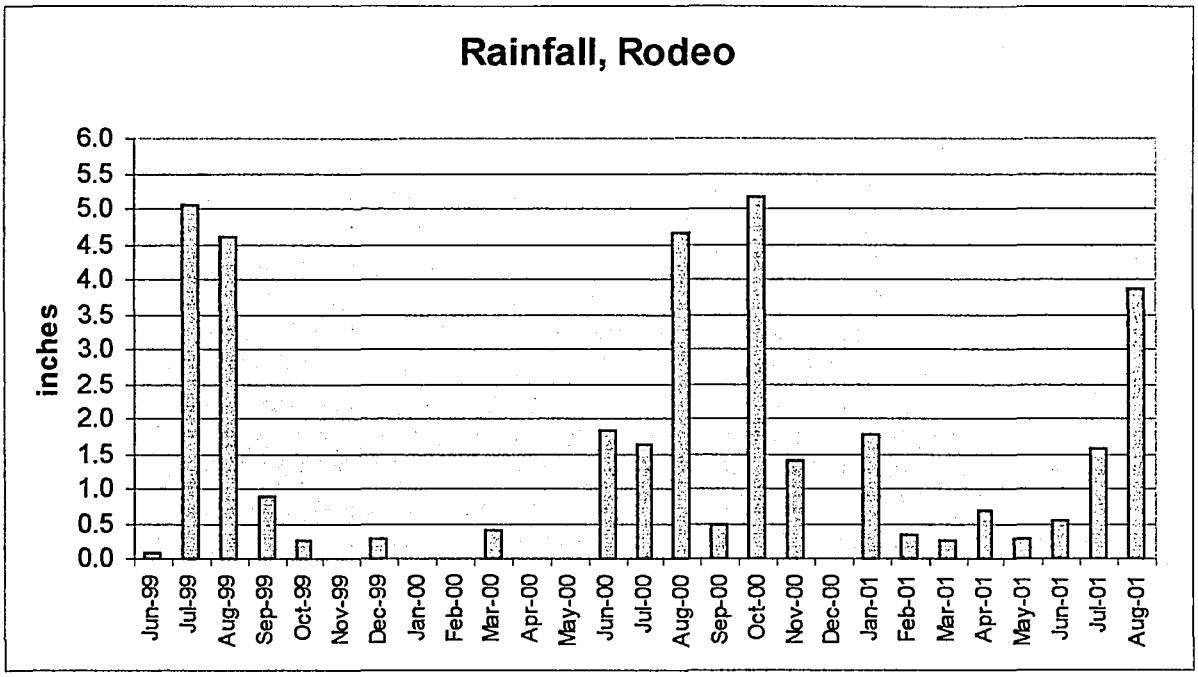
MD-3	Means				t-test P		
	1996	1999	2000	2001	96-99	96-00	96-01
SOIL		59.0	51.8	39.8			
ROCK		3.6	4.0	3.0			
BARE	69.8	62.6	55.8	42.8	0.01	0.00	0.00
LITTER	9.5	16.6	29.8	28.4	0.01	0.00	0.00
PRGL	13.0	5.9	7.8	10.8	0.00	0.01	0.31
ANN FORB	0.0	2.0	0.8	10.3	0.01	0.09	0.00
ANN GRAS	2.1	5.1	1.0	3.3	0.18	0.56	0.52
SPWR BAS	0.5	0.9	0.8	0.2	0.05	0.05	0.27
SPWR CAN	1.0	3.3	0.4	1.3	0.86	0.70	0.63
GUSA	3.7	3.3	0.4	1.2	0.75	0.01	0.02
PPEAR	0.1	0.4	0.6	0.6	0.37	0.15	0.15
HIMU BAS	0.2	0.0	0.1	0.1	0.17	0.56	0.56
HIMU CAN	0.3	0.3	0.4	0.3	1.00	0.77	0.75
MUPO BAS	0.0	0.0	0.1	0.2		0.34	0.05
MUPO CAN	0.4	0.4	0.3	1.6	1.00	0.66	0.07
4WING	0.1	0.4	0.5	0.9	0.37	0.36	0.15
ZIZYPHUS	0.1	0.0	0.0	0.0	0.34	0.34	0.34
CONDALIA	0.6	0.3	0.0	0.1	0.56	0.17	0.25
SEMA BAS	0.0	0.0	0.0	0.0			
SEMA CAN	0.1	0.4	0.0	0.4	0.24	0.34	0.24
PAOB BAS	0.1	0.0	0.0	0.0	0.34	0.34	0.34
PAOB CAN	0.2	0.3	0.0	0.4	0.74	0.34	0.51
BOBA CAN			0.4	0.9			
ARIS CAN				0.8			
CRUXTHRN				0.9			
JHNSNGRS				0.4			
ALL BASAL	0.8	0.0	0.2	0.9	0.01	0.05	0.82
ALL CANOPY	2.0	2.3	1.9	5.8	0.69	0.89	0.01
WOODY SPP	13.9	7.0	8.9	13.3	0.00	0.02	0.78
ANNUALS	2.1	7.1	1.8	13.6	0.06	0.88	0.00

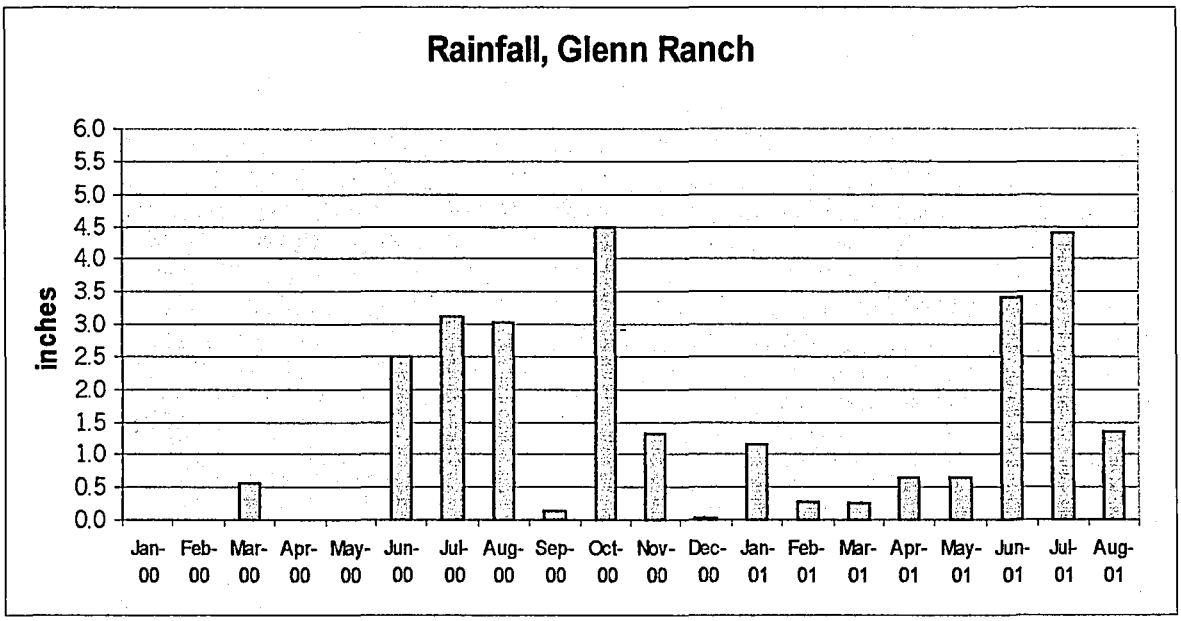
Table 5. Comparison of cover data, 1996-2001, McDonald site.

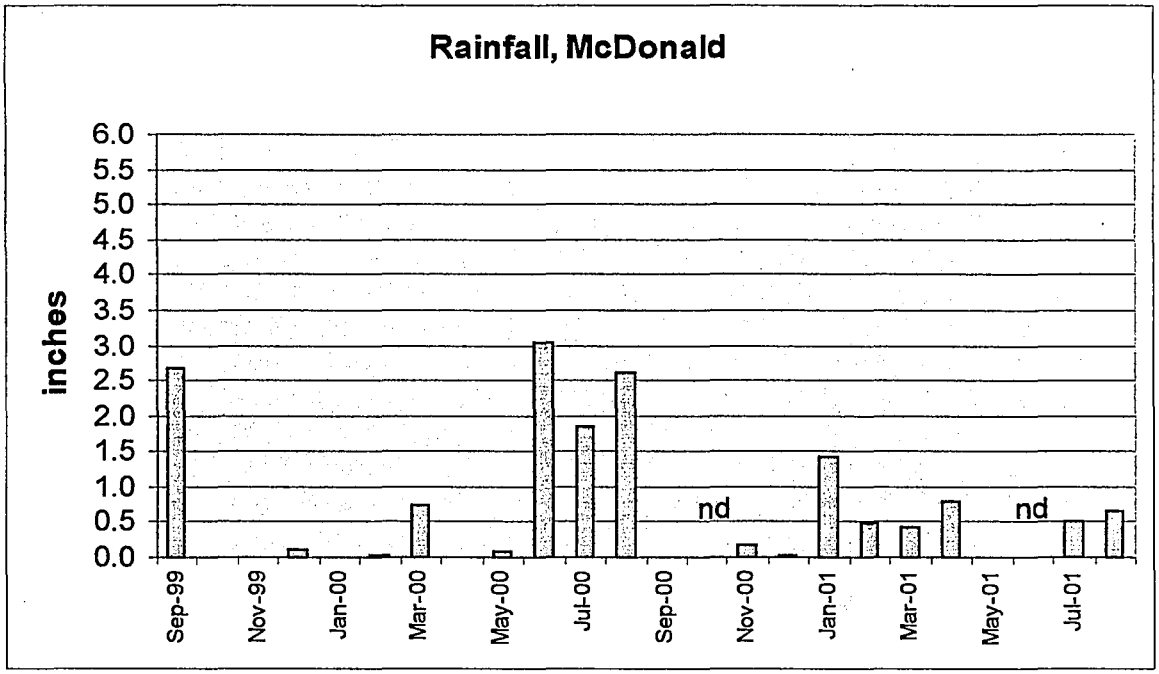
MD-4	Means				t-test P		
	1996	1999	2000	2001	96-99	96-00	96-01
SOIL		49.5	43.4	36.7			
ROCK		4.6	2.7	2.9			
BARE	54.2	54.1	46.1	19.8	0.98	0.05	0.00
LITTER	16.0	12.5	22.5	20.6	0.16	0.02	0.10
ANN FORB	0.4	1.7	0.7	9.9	0.08	0.47	0.00
PRGL	16.7	20.1	25.5	22.9	0.24	0.02	0.06
ANN GRAS	2.0	1.4	0.7	0.7	0.44	0.10	0.09
GUSA	6.6	7.9	0.6	2.7	0.34	0.00	0.00
MUPO BAS	0.1	0.0	0.0	0.0	0.34	0.34	0.34
MUPO CAN	2.3	1.4	0.4	1.1	0.27	0.01	0.11
HIMU BAS	0.1	0.0	0.1	0.0	0.34	1.00	0.34
HIMU CAN	0.3	0.2	0.1	0.4	0.63	0.29	0.71
PAOB BAS	0.0	0.0	0.1	0.0		0.34	
PAOB CAN	0.8	1.4	0.4	1.4	0.43	0.51	0.42
CELTIS	0.4	0.3	0.4	0.2	0.82	1.00	0.59
SPFL BAS	0.1	0.0	0.0	0.0	0.34	0.34	0.34
SPFL CAN	0.2	0.7	0.0	0.1	0.26	0.17	0.56
CONDALIA	0.4	0.2	0.0	0.1	0.59	0.22	0.37
SEMA BAS	0.0	0.0	0.5	0.2		0.14	0.17
SEMA CAN	0.6	0.8	0.9	2.1	0.56	0.50	0.00
BOCU BAS	0.1	0.0	0.0	0.0	0.34	0.34	0.34
BOCU CAN	0.5	0.1	0.0	0.6	0.06	0.01	0.78
ISTE	0.2	0.4	0.3	0.3	0.51	0.63	0.77
ZIZYPHUS	0.1	0.0	0.0	0.0	0.34	0.34	0.34
ARIS BAS	0.0	0.0	0.0	0.0			
ARIS CAN	0.3	0.5	0.0	0.0	0.69	0.34	0.34
RHMI	0.1	0.0	0.0	0.0	0.34	0.34	0.34
SOEL	0.1	0.2	0.0	0.4	0.56	0.34	0.24
4WING			0.3	0.0			
BOBA CAN				0.3			
CRUXTHRN				0.3			
ALL BASAL	0.4	0.0	0.7	0.2	0.04	0.44	0.36
ALL CANOPY	5.0	5.1	1.8	6.0	0.95	0.01	0.39
WOODY SPP	17.7	20.6	26.2	23.5	0.33	0.03	0.09
ANNUALS	2.4	3.1	1.4	10.6	0.54	0.29	0.00

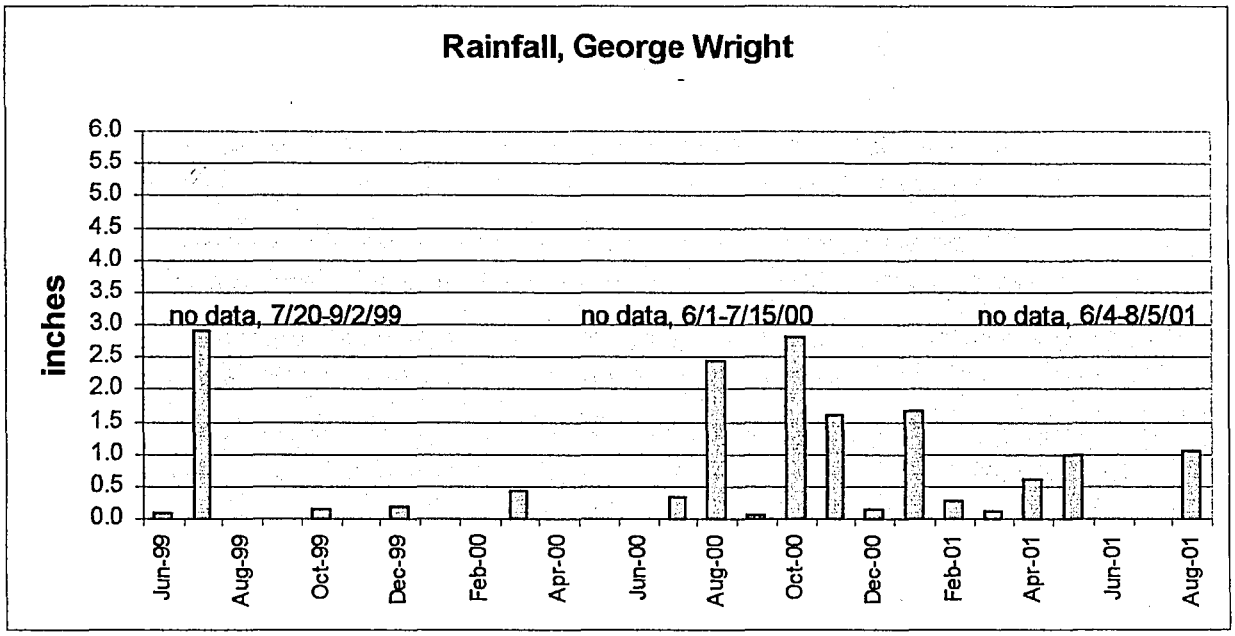
Table 5. Comparison of cover data, 1996-2001, McDonald site.

MD-5, Control	Means				t-test P		
	1996	1999	2000	2001	96-99	96-00	96-01
SOIL		60.3		59.9			
ROCK		4.2		4.4			
BARE	67.3	64.5		64.3	0.56		0.46
LITTER	10.8	9.9		10.5	0.57		0.90
ANN FORB	0.1	0.1		10.5	1.00		0.01
PRGL	14.5	16.8		19.3	0.40		0.10
4WING	0.4	0.6		0.4	0.40		0.94
GUSA	4.2	6.0		0.4	0.07		0.00
OPSPI	0.2	0.0		1.1	0.17		0.03
MUPO BAS	0.1	0.0		0.2	0.34		0.45
MUPO CAN	2.1	3.2		2.3	0.37		0.68
HIMU BAS	0.2	0.0		0.0	0.17		0.17
HIMU CAN	0.6	0.6		0.4	1.00		0.57
SPWR BAS	0.2	0.0		0.1	0.34		0.76
SPWR CAN	0.5	1.5		1.1	0.38		0.47
SEMA BAS	0.0	0.0		0.0			
SEMA CAN	0.1	0.3		0.0	0.41		0.34
ACOU	0.5	1.3		1.3	0.08		0.24
PAOB BAS	0.0	0.0		0.0			
PAOB CAN	0.1	0.1		0.0	1.00		0.34
BOCU BAS	0.1	0.0		0.0	0.34		0.34
BOCU CAN	0.1	0.0		0.0	0.34		0.34
ARIS CAN				0.4			
ALL BASAL	0.6	0.0		0.4	0.05		0.51
ALL CANOPY	3.4	5.0		4.0	0.41		0.70
WOODY SPP	14.6	15.9		21.1	0.69		0.05
ANNUALS	0.1	0.1		1.8	1.00		0.01


Rainfall, Rodeo
inches
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
Jun-99
Jul-99
Aug-99
Sep-99
Oct-99
Nov-99
Dec-99
Jan-00
Feb-00
Mar-00
Apr-00
May-00
Jun-00
Jul-00
Aug-00
Sep-00
Oct-00
Nov-00
Dec-00
Jan-01
Feb-01
Mar-01
Apr-01
May-01
Jun-01
Jul-01
Aug-01


Rainfall, Glenn Ranch
inches
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
Jan-00
Feb-00
Mar-00
Apr-00
May-00
Jun-00
Jul-00
Aug-00
Sep-00
Oct-00
Nov-00
Dec-00
Jan-01
Feb-01
Mar-01
Apr-01
May-01
Jun-01
Jul-01
Aug-01


Rainfall, McDonald
inches
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
nd
nd
Sep-99
Nov-99
Jan-00
Mar-00
May-00
Jul-00
Sep-00
Nov-00
Jan-01
Mar-01
May-01
Jul-01


Rainfall, George Wright
inches
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
no data, 7/20-9/2/99
no data, 6/1-7/15/00
no data, 6/4-8/5/01
Jun-99
Aug-99
Oct-99
Dec-99
Feb-00
Apr-00
Jun-00
Aug-00
Oct-00
Dec-00
Feb-01
Apr-01
Jun-01
Aug-01

Includes all those species found in P. Sundt's monitoring plots from 1993 to October 2001.
Authorities various, principally Kearney & Peebles, Arizona Flora, Gould, Grasses of southwestern United States, Benson & Darrow, Trees and Shrubs of the Southwestern Deserts, Benson, Cacti of Arizona, Martin et al, Fall Wildflowers of New Mexico, and Allred, Field Guide to the Grasses of New Mexico. Nomenclature is probably archaic in many cases
Thanks for help in identification to R.M. Turner, M. Quinn, R. Felger, P. Warren, R. Van Devender, P. Jenkins.

Field Code	Common name	Scientific name
3 balls		Tragia sp
ABUT		Abutilon sp
ACA SP		Acalypha sp
ACAN	Fern acacia	Acacia angustissima
Acan		Acacia angustissima
ACCO	Whitethorn	Acacia constricta
ACMI		Acacia millefolia
ACOU	Desert holly	Acoutria sp
AGAVE	Century plant, mescal	Agave sp
AGPA		Agave palmeri
AGROSTIS	Bentgrass	Agrostis sp
AGSC		Agrostis scabra
alfalfa		Medicago sativa
ALIN		Allionia incarnata
ALLIUM	Wild onion	Allium sp
ALOYSIA	Aloysia	Aloysia sp
Amar palm		Amaranthus palmeri
AMARANTH		Amaranthus sp
Ambro		Ambrosia psilostachya
AMBROSIA	perennial ragweed	Ambrosia sp
ANN ARIS		Aristida adscensionis
ANN BOUTELOUA		Bouteloua barbata
ann Dalea		Dalea sp
ann Eragr		Eragrostis sp
ANN ERAGROSTIS		Eragrostis pectinacea
ANN FLUFFGRASS		Munroa squarrosa
ANN FUZZGRASS		unknown annual grass
ANN NEEDLE		Bouteloua aristidioides
ANN PANICUM		Panicum arizonica
ann Setaria		Setaria sp
ann Sphaer		Sphaeralcea sp
annual Ledu		Digitaria ciliaris
annual Panic		Eriochloa sp
Anoda		Anoda cristulata
Anthericum		Anthericum (=Echeandia) flavescens
Apodanthera		Apodanthera undulata
Aq arrow leaf		Ludwigia
aq Fork grass		Paspalum distichum
Aq swollen nodes		Polygonum sp
aquatic Fuzz grass		Echinochloa sp
ARABIS		Arabis perennans
ARAR	Madrone	Arbutus arizonica
ARFR		Artemisia frigida
ARIS	Three awn grasses	perennial Aristida spp
Aris ads		Aristida adscensionis
Aris tem		Aristida ternipes
AROR	Bentawn, beggartick	Aristida orcuttiana

ART SP		Artemisia filifolia
ASCLEP		Asclepias sp
ASHI		Aspicarpa hirtella
ASTER	Aster	Chaetopappa ericoides
ASTRAG		Astragalus spp
Astragalus		Astragalus nuttalianus
ATCA	Fourwing saltbush	Atriplex canescens
ATRIPLEX	Fourwing saltbush	Atriplex canescens
axil flowers or axil Comp		Pectis prostrata
AYFI		Ayenia filiformis
BAAB		Bahia absinthifolia
BACCH		Baccharis sp
BACCHARIS (RW2)		Baccharis pteronioides
Bagl or Bacc glut	Seepwillow	Baccharis glutinosa
BAHIA		Bahia absinthifolia
BAILEYA	Baileya	Baileya multiradiata
BAPT	Yerba de pasmo	Baccharis pteronioides
BARREL	Barrel cactus	
BASA	Desert broom	Baccharis sarothroides
Basil		Acalypha neomexicana
BEANVINE 1		Macroptilon sp
BENTAWN	Bentawn, beggartick	Aristida orcuttiana
BERMUDA	Bermuda grass	Cynodon dactylon
bladderpod		Crotalaria sagittalis
blue mint		Salvia subincisa
BOBA	Cane beardgrass	Bothriochloa barbinodis
BOCH	Sprucetop grama	Bouteloua chondrosioides
BOCO		Boerhaavia coccinea
BOCU	Sideoats grama	Bouteloua curtipendula
BOER	Black grama	Bouteloua eriopoda
Boer coc or Boco		Boerhaavia coccinea
BOGR	Blue grama	Bouteloua gracilis
BOHI	Hairy grama	Bouteloua hirsuta
BOMELIA	Chittum wood	Bumelia lanuginosa
BORAD	Purple grama	Bouteloua radicosa
BOU SP		Bouteloua barbata
BOUARI		Bouteloua aristidioides
Brachy		Brachyeria arizonica
BRDE		Brayulinea densa
Brick chl		Brickellia chlorolepis
Brick or Brickellia		Brickellia sp
BROM		Bromus sp
BROMUS		Bromus sp
BUDA	Buffalograss	Buchloe dactyloides
buffalogourd		Cucurbita foetidissima
CABA	Locoweed	Cassia bauhinioides
CAER	Fairyduster	Calliandra eriophylla
Cal hum		Calliandra humilis
CARE		Calliandra cf reticulata
CASSIA		Cassia wrightii
Cassia		Chamaecrista serpens var wrightii
CAST		Castilleja sp
CEMO	Mountain mahogany	Cercocarpus montanus
CERE	Net leaf hackberry	Celtis reticulata
cf BRICKELLIA (RW3)		Trixis californicus

cf SALVIA		cf Salvia sp
cf TRAR		Ayenia filiformis
cfMURIG		cf Muhlenbergia rigida
Chamae		Chamaecrista nictitans
CHCO	"Lobo"	Chamaeseracha coronopus
CHLI	Desert willow	Chilopsis linearis
CHNA	Rabbitbrush	Chrysothamnus nauseosus
CHVI		Chloris virgata
clover		Oxalis albicans
COCA	Coldenia	Coldenia canescens
cocklebur		Xanthocephalum sp
CODI	Dayflower	Commelina dianthifolia
CONDALIA		Condalia sp
Conv inc		Convolvulus incanus
Conv lin		Convolvulus linearilobus
Convolv		Convolvulus sp
CORY		Coryphantha sp
CRCO	Croton	Croton corymbulosus
CREEP		Erigeron flagellaris
CREO	Creosote bush	Larrea tridentata
CRINKLE LF		Chamaesaracha coronopus
CRINKLEAWN	Crinkleawn grass	Trachypogon montufari
Croton		Croton sp
CRUCIFER		unknown Cruciferae
CUSCUTA	Dodder	Cuscuta sp
CYDA	Bermuda grass	Cynodon dactylon
DAFO	Woody or feather dalea	Dalea formosa
daisy		Erigeron sp
DALEA		Dalea sp
DAPO		Dalea pogonothera
DAPU	Fluffgrass	Dasyochloa pulchella
DATURA	Jimson weed	Datura sp
DAWH	Sotol	Dasylirion wheeleri
DAWI		Dalea wislizenii
DAWR		Dalea wrightii
DECO		Desmanthus cooleyi
DESERT BROOM	Desert broom	Baccharis sarothroides
Desmodium		Desmodium scopularum
DICA	Arizona cottontop	Digitaria (=Trichachne) californica
dry Comp		Cyperus sp
DYDE		Dyschoriste decumbens
DYSP		Dyschoriste decumbens
Ecco		Echinochloa colonum
ECFE		Echinocereus fendleri
ELAR		Elymus arizonicus
ELBA	Wooly bunchgrass	Elyonurus barbiculmis
EPHEDRA	Mormon Tea	Ephedra sp
EPTO		should be EPTR
EPTR		Ephedra trifurca
ERAN		Eriogonum annuum
ERCH	Boer lovegrass	Eragrostis chloromelas
ERCI	Stinkgrass	Eragrostis cilianensis
ERCU	Weeping lovegrass	Eragrostis curvula
ERFL		Erigeron flagellaris
ERIG		Erigeron sp

ERIN	Plains lovegrass	Eragrostis intermedia
ERIO		Erioneuron(=Dasyochloa) pulchella
Eriochloa		Eriochloa sp
ERLA		Ericameria (=Haplopappus) laricifolius
ERLE	Lehmann's lovegrass	Eragrostis lehmanniana
ERSP		Ericameria sp
ERWR	Shrubby buckwheat	Eriogonum wrightii
EULA	Winterfat	Eurotia lanata
Eup albo		Euphorbia alboemarginata
Eup cap		Euphorbia capitelata
Eup het		Euphorbia heterophylla
Eup mic		Euphorbia micromera
Eup sp		Euphorbia sp
EUPHORB		unk Euphorbiaceae
Euphys		Euphorbia hyssopifolia
EVOL		Evolvulus sp
Evol ariz		Evolvulus arizonicus
EVSE		Evolvulus sericeus
EYSENHARDTIA	Kidneywood	Eysenhardtia polystachya
FAPA	Apache plume	Fallugia paradoxa
FERN	Fern	Unknown Pteridophyte
flat bract		Zornia reticulata
FLAT SPURGE		Euphorbia sp
FORB	Annual forbs (lumped)	
forked Paspalum		Paspalum dilitatum
FOURWING	Fourwing saltbush	Atriplex canescens
FOX		Foxtail-like grass
FRVE	Arizona ash	Fraxinus velutina
fuzzy seed aquatic		Echinochloa sp
GAILL		Gaillardia sp
Galactia		Macroptilium gibosifolium=Phaseolus heterophyllum
GAMI		Galium microphyllum
GARRYA	Silktassel bush	Garrya wrightii
GARWR	Silktassel bush	Garrya wrightii
GASP		Gaura sp
GAURA	Gaura	Gaura coccinea
GERAN		Geranium-like forb
Globe Mint Vine		Mitracarpus breviflorus
GNWR		Gnaphalium wrightii
Gomphrena		Gomphrena sp
GRAS	Annual grasses (lumped)	
GRND CHERRY	Ground cherry	Solanum
GUSA	Broom snakeweed	Gutierrezia sarothrae
HAIRY SIDA		Sida sp
HALA	Turpentine bush	Haplopappus laricifolius
HATE	Burroweed	Haplopappus (=Isocoma) tenuisectis
HECI		Helianthus ciliaris
HECO	Tanglehead	Heteropogon contortus
HEDE		Hedeoma dentatum
HEDGEHOG	Hedgehog cactus	Echinocereus or Neolloydia sp
HIBE	Curly mesquite grass	Hilaria berlangeri
HIMU	Tobosa	Hilaria mutica
HODE	Hog potato	Hoffmansegia densa
horsetail		Equisetum sp
HYAT	Purple	Hybanthus attuenuatus

HYMO	Burrobrush	Hymenoclea monogyra
HYWI		Hymenothrix wislizenii
IPLE		Ipomoea leptotoma
IPOM		Ipomaea sp
Ippl		Ipomaea plummerae
IPTH		Ipomaea thurberi
ISTE	Burroweed	Isocoma tenuisectis
JAMA		Jatropha macrorhiza
Johnsongrass		Sorghum halepense
JUDE	Alligator Juniper	Juniperus deppeana
JUMA	Arizona walnut	Juglans major
JUMO	Oneseed Juniper	Juniperus monosperma
JUN SP		Juniperus sp
Juncus		Juncus sp
Kallstroemia		Kallstroemia grandiflora
Knotgrass		Paspalum dilitatum
KOCR	Junegrass	Koeleria cristata
KOSP	Crucifixion thorn	Koeberlinea spinosa
Krameria		Krameria lanceolata
KRLA		Krameria lanceolata
lamb's-ear		Asclepias sp
LARREA	Creosote bush	Larrea tridentata
lavender ray Comp		Cosmos parviflorus
LEDU	Green sprangletop	Leptochloa dubia
LEFE	Silverballs	Lesquerella fendleri
legume		Psoralea sp
LIPPIA		Lippia sp
little yellow Comp		Melampodium sp
LOBO		Chamaesaracha coronopus
LOCO	Locoweed	Cassia bauhinioides
long linear lf		unidentified
LONGLEAF		unknown forb
LOOR		Lotus oroboides
LOTUS		Lotus sp
LYCIUM	Wolfberry	Lycium sp
LYPH	Wolftail grass	Lycurus phleoides
Machaeranthera		Machaeranthera sp
MALPIG		Aspicarpa hirtella
MALVACEAE		Hibiscus denudatus
MAMMI		Mammilaria sp
MANZ	Manzanita	Arctostaphylos pungens
MAPI		Machaeranthera pinnatifida
Margaranthus		Margaranthus solaceus
MARIOLA	Mariola	Parthenium incanum
MATA		Machaeranthera tanacetifolius
MAUR		Maurandya sp
MAVU	Horehound	Marrubium vulgare
MELE		Melampodium leucanthum
MESC		Menodora scabra
MIBI	Catclaw mimosa	Mimosa biuncifera
MIDY	Velvet pod mimosa	Mimosa dysocarpa
Milla		Milla biflora
MOLLUGO	"Rosie floret"	Mollugo verticillata
MOVE		Mollugo verticillata
MOSS	Moss	unknown Pteridophyte

MUAR	Sand muhly	Muhlenbergia arenicola
MUEM	Bullgrass	Muhlenbergia emersleyi
MUH SP		Muhlenbergia sp
Muhly		Muhlenbergia sp
MUPO	Bush muhly grass	Muhlenbergia porteri
MURE	Aparejo grass	Muhlenbergia repens
MURI	Deergrass	Muhlenbergia ridgens
NOMI	Sacahuiste, beargrass	Nolina microcarpa
OCOTILLO	Ocotillo	Fouquiera splendens
OENO	Evening primrose	Oenothera sp
OPEN PANICLE		Panicum hirticaule
opposite leaves or Opp Lvs		Aspicarpa sp
OPSPI	Cholla	Opuntia spinosior
OPULEP	Christmas cactus	Opuntia leptocaulis
OXLI		Oxybaphis linearis
OXY		Oxytropis sp
PABU		Panicum bulbosum
PAIN	Mariola	Parthenium incanum
PAN sp	Panic grass	Panicum hirticaule
PAOB	Vine mesquite grass	Panicum obtusum
PAPERFLR	Paperflower	Psilostrophe sp
PASE		Paspalum setaceum
Paspalum		Paspalum dilitatum
peavine		Rhynchosia texana
PEFL		Petalostemum flavescens
PELI		Penstemon linarioides
PEN SP	Penstemon	Penstemon sp
PENST	Penstemon	Penstemon sp
Penstemon		Penstemon dasyphyllus
per Sphaer		Sida spinosa
perennial Aris		Aristida sp
PHCU	"P38"	Phyla cuneifolia
PHYSALIS	Ground cherry	Physalis sp
PICE	Mexican pinon pine	Pinus cembroides
PIDI	Pinon pine	Pinus discolor
PIED	Pinon pine	Pinus edulis
PIEN	Apache pine	Pinus engelmannii
PIFI	Pinon ricegrass	Piptochaetium fimbriatum
PIFL	White pine	Pinus flexilis var reflexa
PILE	Chihuahua pine	Pinus leiophylla
PINON	Pinon pine	Pinus sp
PIPO	Ponderosa pine	Pinus ponderosa
PIPR		Piptochaetium pringlei
Poa		Poa sp
POFR	Cottonwood	Populus fremontii
Poinsettia		Euphorbia heterophylla
POL SP		Polygonum sp
Polygala		Polygala sp
POOB		Polygala obscura
Port suff		Portulaca suffrutescens
Port umbr		Portulaca umbraticola
PORTULACA	Purslane	Portulaca sp
POTR	Aspen	Populus tremuloides
PPEAR	Prickly pear	Opuntia sp
PRGL	Honey mesquite	Prosopis glandulosa

Probosc		Proboscidea parviflora
PROBOSCIDEA	Devil's claw	Proboscidea sp
PROSOPIS	Mesquite	Prosopis sp
PRVE	Velvet mesquite	Prosopis velutina
PRVI	Chokecherry	Prunus virgata
PSME	Douglas fir	Pseudotsuga menziesii
PSOR		Psoralcea tenuiflora
PSTA		Psilostrophe tagetina
PURPLE		Hybanthus attenuatus
purple Comp		Aster exilis
PURPLE LINEAR		unknown forb
PURPLE TRUMPET		Ipomoea leptotoma
QUAR	Arizona white oak	Quercus arizonica
QUE SP		Quercus sp
QUEM	Emory oak	Quercus emoryi
QUERCUS		Quercus sp
QUGA	Gambel oak	Quercus gambeli
QUHY	Silverleaf oak	Quercus hypoleucoides
QURU	Netleaf oak	Quercus rugosa
QUTO	Toumey oak	Quercus toumeyi
RAINBOW	Rainbow cactus	Echinocereus cf pectinatus
rare Talinum		Talinum sp
red Comp		Zinnia peruviana
red Convolv		Ipomaea cristata
RED GLAND		Eriochloa acuminata
REED	reed	Juncus sp
RHCH	Evergreen sumac	Rhus choriophylla
RHMI	Littleleaf sumac	Rhus microphylla
RHRA	Poison oak	Rhus radicans
RHTE		Rhyncosia texana
RHTR	Skunkbush	Rhus trilobata
RONE	New Mexico locust	Robinia neomexicana
ROSETTE	Rosie floret	Mollugo verticillata
RUMEX		Rumex sp
Rush		Juncus sp
SACATON	Sacaton	Sporobolus wrightii
SAGO	Black willow	Salix goodingii
SAKA	Tumbleweed	Salsola kali
Salix taxif		Salix taxifolia
Sandbur		Cenchrus pauciflorus
SASA	Soapberry	Sapindus saporina
SATA	Yewleaf willow	Salix taxifolia
SCBR	Burrograss	Scleropogon brevifolius
SCCI	Texas bluestem	Schizachrium cirratum
SEDGE	Sedge	Carex spp
sedge		Cyperus sp
SELLOA		Selloa sp
SELO		Senecio longiloba
SEMA	Plains bristlegrass	Setaria macrostachya
SIDA		Sida sp
SIHY	Squirreltail grass	Sitanion hystrix
SILE		Sida lepidota
SINE		Sida neomexicana
SOEL	Horsenettle	Solanum eleagnifolium
SOLANACEAE	Prickly tomato	unk Solanaceae

sotol		Dasylirion wheeleri
SPCO	Spike dropseed	Sporobolus contractus
SPFL	Mesa dropseed	Sporobolus flexuosus
SPH SP	Mallow	Sphaeralcea sp
SPORO		Sporobolus sp
SPRUCE	Engelmann spruce	Picea engelmannii
SPRUCETOP	Sprucetop grama	Bouteloua chondrosioides
SPSP	Mallow	Sphaeralcea sp
SPSU	Mallow	Sphaeralcea subhastata
SPWR	Sacaton	Sporobolus wrightii
star bract		Acalypha ostryaefolia
STEPH		Stephanomeria sp
stiff Mint		Diodia teres
STPA		Stephanomeria pauciflorus
succ Euphorb		Euphorbia dentata
SYOR	Snowberry	Symphoricarpos oreophilus
3 balls		Tragia sp
TAAU		Talinum aurantiacum
TARBUSH	Tarbush	Flourensia cernua
THELO		Thelosperma megapotamicum
thick mint		Salvia subincisa
Thistle		Cirsium arizonica
THMO		Thermopsis montanum
Tiliaceae		Corchorus sp (Tiliaceae)
tiny sedge		Cyperus squarrosus
Tradesc		Tradescantia cf occidentalis
TRAGIA		Tragia sp
TRAR		Trichostemma arizonica
TRCA		Trichachne (=Digitaria) californica
triangle bulrush		Scirpus sp
tripod Comp		unknown Asteraceae
TRIXIS		Trixis californicus
TRMO	Crinkleawn	Trachypogon montufari
TRMU		Tridens muticus
TRPI		Tradescantia pinetorum
TRPU	Fluffgrass	Tridens (=Dasyochloa) pulchella
TUMBLE		Tall comp forb, sm white flrs, short lvs
TURP	Turpentine bush	Haplopappus laricifolius
UNID		Unidentifiable
UNIF		unknown perennial forb
Unk fine grass		Bulbostylis capillaris
UNKC		unknown Composite forb
UNKCSH		Unknown Composite shrub
UNKF		Unknown perennial forb
UNKG		Unknown perennial grass
UNKSH		Unknown shrub
UP SPURGE	upright spurge	Euphorbia sp
VEGR		Verbena gracilis
VER SP		Verbena sp
VERBENA		Verbena sp
VIAR	Grape	Vitus arizonica
Viguiera		cf Viguiera sp
WHTHORN	Whitethorn	Acacia constricta
WOODY DALEA		Dalea formosa
WOOLY	Wooly bunchgrass	Elyonuron barbiculmis

XMAS	Christmas cactus	Opuntia leptocaulis
yellow Comp		Bidens aurea
yellow cup Comp		Melampodium sp
YUBA	Spanish dagger	Yucca baccata
YUCCA		Yucca sp
YUEL	Soapweed Yucca	Yucca elata
YUSC	Mountain Yucca	Yucca schottii
ZAUS		Zauschneria sp
ZEPO		Zexmania podocephala
Zexmania		Zexmania (=Lasianthaea) podocephala
ZIGR	Desert zinnia	Zinnia grandiflora
Zigr		Zinnia grandiflora
ZIOB	Crucifixion thorn	Ziziphus obtusifolia
		Convolvulus sericeus
		Euphorbia micromeria
		Lithospermum cobrensi
		Aristida gentilis

Report to the Malpai Borderlands Group:

Vegetation Manipulation Experiments, 1996-2000

Peter Sundt
Rangeland Consultant
Pima, Arizona

December 19, 2000

Report to the Malpai Borderlands Group:

Vegetation Manipulation Experiments, 1996-2000

Peter Sundt
Rangeland Consultant
Pima, Arizona

December 19, 2000

Introduction

In the fall of 1996 experimental treatment plots were established at 5 locations in the Malpai Borderlands region: the Ed Roos Ranch near Rodeo, New Mexico, the Glenn Ranch near Douglas, Arizona, the San Bernardino National Wildlife Refuge near Douglas, the McDonald Ranch along Cottonwood Creek in Arizona, and the George Wright pasture of the Gray Ranch, south of Animas, New Mexico. At each of these sites, with the exception of the McDonald Ranch, a rectangular grid of 12 large plots was marked, each plot being 500ft x 500ft. The entire grid was fenced to exclude cattle, and a weather station erected. The plots were sampled in 1996 before treatment to estimate canopy cover of all plant species and of bare ground and litter, and basal cover was estimated for perennial grasses. Details of the sampling methods were provided in my 1996 report to MBG. In the spring of 1999 the following treatments were applied to randomly-chosen subsets of the plots at each site (Table 1): 1) control (no treatment); 2) crushing of the vegetation with a large water-filled drum pulled behind a Cat; 3) crushing and seeding of several perennial grasses with a range drill towed behind the crusher. In 1999 and 2000 all of the plots were re-sampled, using the same methods as in 1996. The San Bernardino Refuge site was not subjected to any of the crushing or seeding treatments; however, a wildfire occurred there in 1997, and it was re-sampled in 1999 and 2000.

Table 1. Treatments by plot.

Plot number	George Wright site	Roos Ranch site	Glenn Ranch site
1	Crush + seed	Crush + seed	Control
2	Crush	Control	Crush
3	Crush	Crush + seed	Crush + seed
4	Control	Crush	Control
5	Crush + seed	Crush	Crush + seed
6	Control	Control	Control
7	Control	Crush	Crush + seed
8	Crush	Control	Crush
9	Control	Crush + seed	Crush + seed
10	Crush + seed	Crush + seed	Crush
11	Crush	Crush	Control
12	Crush + seed	Control	Crush

The McDonald Ranch site consisted of only 5 plots and was subjected to a different

treatment than the other sites. In November, 1998 four of the 5 plots were fenced and hay made from the native grass cane beardgrass (*Bothriochloa barbinodis*) was scattered on the ground. In 3 of the plots mesquites were lopped by hand and the brush scattered. Cattle were introduced for a couple of days to eat the hay, scatter the seeds and trample them into the soil. A very wet storm occurred during the treatment. The site was sampled in 1996, 1999 and 2000.

Results

Following the 1999 sampling there were some clear differences among the plots in response to the treatments. At Glenn Ranch and at George Wright, most of the Control sites had reduced bare ground, due mainly to increased annuals resulting from the good summer rains. This pattern did not hold at the Roos Ranch, where bare ground increased at 3 of 4 Control plots. The Crush + seed treatment was quite effective at the Glenn Ranch, where 3 of 4 seeded plots showed greatly increased cover of plains bristlegrass in 1999. The contrast in grass establishment between the Crush-only and Crush + seed treatments indicates that there was not much perennial grass seed in the soil seedbank. Of the several species in the seed mix, only plains bristlegrass established well.

By 2000, plains bristlegrass and Lehmann's lovegrass had increased at the Roos site in all treatments, including Control (Table 4). These species also increased at several unseeded plots at the George Wright site, and in one Control plot at Glenn Ranch. These species increased despite dry weather in winter-spring-summer 1999-2000, while other native grasses (threeawns, bush muhly, cottontop) were decreasing.

Most plots, whether treated or not, showed a net decrease in snakeweed and burroweed since 1996; the dry weather was probably responsible for most of the mortality of these species.

At several of the crushed plots bush muhly decreased in cover following the treatment, probably because existing plants living under tree and shrub canopies were damaged by the crushing. By 2000 the cover of bush muhly had not recovered in treated plots, even though at the Roos site it had increased in the Control plots.

The San Bernardino Refuge site was not subjected to the crushing treatment, but a wildfire occurred there in 1997, and the plots were re-sampled in 1999 and 2000. Table 5 shows that bare ground increased in all 10 of the burned plots, but not in the single unburned nor in the partly-burned plot. The fire did reduce cover of whitethorn and mesquite, but all grass species suffered reductions in cover.

The results of the trampling treatments at the McDonald site were rather disappointing. Very little new grass was established, and the cover of mesquite is rapidly recovering from the lopping treatment (now it bears fierce new thorns). The only significant changes since 1999 has been a lack of annuals, and drought mortality of snakeweed.

Interpretation of data tables

The full datasets are presented in Microsoft Excel workbooks, one workbook for each

site, on the floppy disk which accompanies this report. Summaries are included in this report as data tables 1-5. The data tables include results from t-tests, comparing mean cover values of each species between 1996 and 1999, 1996 and 2000, and 1999 and 2000. The P values presented indicate the probability that the 2 means from each comparison are statistically identical. To evaluate the level of confidence in the differences between means for more than 2 samples (i.e. for a multiple year comparison) it is necessary to apply the so-called "Bonferonni adjustment" to the critical value. The adjustment must be made to the t-test results whenever more than one pair of years are compared, and consists of dividing by the number of comparisons the desired critical value of P (Elzinga et al. 1998). For example, to assert with 80% confidence that the cover value of a species in year 2000 is different from both previous years' requires that both comparisons (i.e. 96-00 and 99-00) have P values < 0.10. However, to compare only 2000 data to 1996 data requires P< 0.20 for the same level of confidence.

Literature Cited

Elzinga, C.L et al. 1998. Measuring and monitoring plant populations. BLM Tech Ref 1730-1.

Table 2. Significant changes, 1996-2000, Glenn Ranch site.

Treatment	Plots	increase	decrease
Control	WG1		Snakeweed, threeawns
	WG4	Annual grass, whitethorn, mesquite, bristlegrass	Bare ground, snakeweed
	WG6		snakeweed
	WG11	whitethorn, tarbush	Snakeweed, threeawns, bush muhly, vine mesquite, cottontop
Crush +seed	WG3	annuals, bristlegrass	Bare ground, mesquite, tarbush
	WG5		Annual forbs, whitethorn, snakeweed, mesquite, threeawns
	WG7	annuals, bristlegrass	Whitethorn, mesquite, tarbush, snakeweed, bush muhly
	WG9	bristlegrass	Annual forbs, whitethorn, snakeweed, tarbush
Crush only	WG2	Annuals	Mesquite, tarbush
	WG8	annuals	Mesquite, snakeweed, bush muhly, whitethorn,
	WG10	Annual grasses	Whitethorn, snakeweed
	WG12		Annual grasses, snakeweed, bush muhly

Table 3. Significant changes, 1996-2000, Roos Ranch site

Treatment	**Plots**	**increase**	**decrease**
Control	ER2	Annual forbs, bristlegrass	
	ER6	bare ground, bush muhly	Annual forbs, burroweed, snakeweed
	ER8	bare ground, bristlegrass, bush muhly	annuals, burroweed, snakeweed, threeawns
	ER12	bare ground, Lehmann's lovegrass, mesquite, bush muhly, bristlegrass	annuals, burroweed, snakeweed, threeawns
Crush +seed	ER1	annual forbs, plains bristlegrass	mesquite
	ER3	bare ground, bristlegrass, lovegrass	annual forbs, burroweed, bush muhly
	ER9	bare ground, bristlegrass, lovegrass	Annuals, bush muhly
	ER10	bare ground, bristlegrass	decrease annuals, burroweed, bush muhly, threeawns
Crush only	ER4	bristlegrass, lovegrass	Annual forbs, burroweed, mesquite, bush muhly, threeawns
	ER5	Bristlegrass, lovegrass	Mesquite, threeawns, snakeweed, bush muhly
	ER7	Annuals, lovegrass, bristlegrass	burroweed
	ER11	bare ground, bristlegrass, lovegrass	annual forbs, burroweed, threeawns, snakeweed, bush muhly

Table 4. Significant changes, 1996-2000, George Wright site

Treatment	**Plots**	**increase**	**decrease**
Control	GW4	threeawns	annual forbs
	GW6	Bare ground	annual forbs
	GW7	bristlegrass	annual forbs, threeawns
	GW9	Mesquite, threeawns, snakeweed, bristlegrass	Bare ground, annual forbs
Crush +seed	GW1	Bare ground, annual grasses, bristlegrass, cane beardgrass, threeawns	annual forbs, mesquite, snakeweed
	GW5	Bare ground, vine mesquite	annual forbs, mesquite
	GW10	Threeawns, bristlegrass	mesquite
	GW12	Threeawns, vine mesquite, bristlegrass	annual forbs, mesquite
Crush only	GW2	Bristlegrass, cane beardgrass, threeawns, vine mesquite, lovegrass	annual forbs, mesquite, snakeweed
	GW3	Bare ground, bristlegrass, vine mesquite	mesquite
	GW8	Bare ground, bristlegrass	mesquite
	GW11	Annual grasses, threeawns	Mesquite, burrograss

Table 5. Significant changes, 1996-2000, San Bernardino site

Treatment	Plots	increase	decrease
Unburned	SB1	whitethorn	Threeawns, snakeweed, bush muhly
Partly burned	SB7	Annual forbs	Threeawns, cottontop, bush muhly, snakeweed, bristlegrass
Wildfire 1997	SB2	Annual grasses	Threeawns, snakeweed, bush muhly, whitethorn
	SB3	Bare ground	Whitethorn, snakeweed, threeawns, annual forbs
	SB4	Bare ground	Mesquite, whitethorn, threeawns, tobosa, annual forbs
	SB5	Bare ground	Mesquite, whitethorn, threeawns, tobosa, annuals
	SB6	Bare ground	Whitethorn, annual forbs, tobosa, vine mesquite
	SB8	Bare ground	Threeawns, whitethorn, annual forbs, snakeweed
	SB9	Bare ground	Mesquite, whitethorn, vine mesquite, threeawns
	SB10	Bare ground	Vine mesquite, threeawns, annual forbs
	SB11	Bare ground	Tobosa, whitethorn, threeawns, annuals
	SB12	Bare ground	Tobosa, annuals

GLEN J

PLOT WG1
DATE OCT 8 96

	1	2	3	4	5	6	7	8	9	10	MEAN	S.E.
BARE	41	54	55	60	42	58	60	45	37	44	49.6	2.6
LITTER	6	8	14	5	8	10	8	14	26	17	11.6	1.9
FORB	1	2	0	3	0	2	2	3	1	1	1.5	0.3
ANN GRASS	23	5	3	1	18	2	6	8	4	5	7.5	1.5
WHITETHOR	14	20	11	5	14	11	10	6	9	9	10.9	1.3
PRGL	4	4	7	18	9	3	5	8	5	7	7	1.3
GUSA	4	3	6	4	3	12	9	4	7	10	6.2	1.0
SOEL	0	0	1	0	0	2	0	1	1	1	0.6	0.2
ARIS BAS	2	0	0	0	2	0	0	0	0	0	0.4	0.2
ARIS CAN	6	8	5	3	10	4	0	7	9	8	6	1.0
HIMU BAS	1	1	0	0	0	0	0	0	0	0	0.2	0.1
HIMU CAN	2	2	0	0	5	3	0	0	0	0	1.2	0.5
MUPO BAS	1	0	0	0	0	0	0	0	0	0	0.1	0.0
MUPO CAN	7	5	2	3	0	0	0	0	0	0	1.7	0.6
SEMA BAS	0	0	0	0	0	0	0	0	0	0	0	0.0
SEMA CAN	1	0	0	0	0	0	0	0	0	0	0.1	0.0
PPEAR	1	0	0	0	0	0	0	0	0	0	0.1	0.0
YUEL	2	0	0	0	0	0	0	0	0	0	0.2	0.0
MIBI	1	0	0	0	0	0	0	0	0	0	0.1	0.0

PLOT WG1
DATE 9 Sep 99

	1	2	3	4	5	6	7	8	MEAN	S.E.
SOIL	51	38	41	34	38	27	33	30	36.5	1.**
ROCK	2	5	1	5	0	0	1	5	2.4	0.**
BARE	53	43	42	39	38	27	34	35	38.9	1.**
LITTER	5	9	5	4	5	11	8	9	7.0	0.**
FORB	4	16	14	8	17	15	18	8	13.3	1.**
ANN GRASS	1	4	5	6	4	8	7	16	7.7	1.**
WHITETHOR	1	8	11	24	2	11	12	14	12.3	2.**
PRGL	23	7	9	8	22	6	10	5	10.0	2.**

GUSA	11	9	15	14	10	14	19	17	14.8	1.**
SOEL	0	0	0	2	2	1	0	0	0.8	0.**
ARIS BAS	0	0	0	0	0	0	0	0	0.0	0
ARIS CAN	0	2	0	0	2	0	0	3	0.8	0.**
HIMU BAS	0	0	0	0	0	0	0	0	0.0	0
HIMU CAN	0	0	0	0	5	1	0	1	1.2	0.**
MUPO BAS	0	2	0	0	0	1	2	0	0.5	0.**
MUPO CAN	0	7	1	1	9	5	7	2	4.2	1.**
SEMA BAS	0	0	0	0	0	0	0	0	0.0	0
SEMA CAN	0	4	1	1	5	2	0	0	1.5	0.**
PPEAR	0	0	0	0	0	0	0	0	0.0	0
YUEL	0	0	0	0	0	0	0	0	0.0	0
MIBI	0	0	0	0	0	0	0	0	0.0	0
TARBUSH	8	0	0	0	2	1	0	0	0.5	0.**

PLOT WG1	1996	1999
SOIL		36.5
ROCK		2.4
BARE	49.6	38.9
LITTER	11.6	7.0
WHITETHORN	10.9	10.4
ANN GRASS	7.5	6.4
PRGL	7.0	11.3
GUSA	6.2	13.6
ARIS CAN	6.0	0.9
MUPO CAN	1.7	4.0
ANN FORB	1.5	12.5
HIMU CAN	1.2	0.9
SOEL	0.6	0.6
ARIS BAS	0.4	0.0
HIMU BAS	0.2	0.0
YUEL	0.2	0.0
SEMA CAN	0.1	1.6
MUPO BAS	0.1	0.6
PPEAR	0.1	0.0
MIBI	0.1	0.0
TARBUSH	0	1.4
SEMA BAS	0	0.0

PLOT WG2
DATE OCT 8 96

	1	2	3	4	5	6	7	8	9	10	MEAN	S.E.
BARE	82	77	81	84	69	69	78	68	65	85	75.8	2.3
LITTER	3	1	2	0	3	2	6	13	9	1	1	1.3
FORB	0	0	0	0	0	0	0	0	0	0	0	0.0
ANN GRASS	0	0	0	0	0	0	0	0	0	0	0	0.0
PRGL	7	14	10	9	19	21	15	11	15	9	13	1.5
GUSA	0	0	0	0	0	0	0	0	0	0	0	0.0
TARBUSH	7	7	8	5	8	7	3	7	7	6	6.5	0.5
4WING	1	1	1	0	0	0	0	0	0	0	0.3	0.2
MUPO BAS	0	0	0	0	0	0	0	0	0	0	0	0.0
MUPO CAN	0	0	0	0	0	0	0	0	0	0	0	0.0
ACOU	1	1	0	0	0	0	0	0	0	0	0.2	0.1

PLOT WG2
DATE 9-Sep-99

	1	2	3	4	5	6	7	8	9	10	MEAN	S.E.
SOIL	60	75	71	70	70	65	77	74	72	68	70.2	1.6
ROCK	4	6	4	2	9	9	10	4	2	5	5.5	0.9
BARE	64	81	75	72	79	74	87	78	74	73	75.7	1.9
LITTER	9	9	11	4	5	11	5	11	10	7	8.2	0.9
FORB	9	1	4	17	9	7	1	6	7	12	7.3	1.5
ANN GRASS	9	0	0	1	0	1	0	1	2	1	1.5	0.9
PRGL	7	5	5	4	3	6	5	3	6	5	4.9	0.4
GUSA	1	0	0	0	0	0	0	0	0	0	0.1	0.1
TARBUSH	3	2	1	0	0	1	2	1	1	1	1.2	0.3
4WING	0	0	0	0	0	0	0	0	0	0	0	0.0
MUPO BAS	0	0	0	0	0	0	0	0	0	0	0	0.0
MUPO CAN	0	0	0	0	0	0	0	0	0	0	0	0.0
ACOU	1	0	0	0	0	0	0	0	0	0	0.1	0.1
SEMA BAS	0	0	0	0	0	0	0	0	0	0	0	0.0
SEMA CAN	3	1	0	2	0	0	0	0	2	0	0.8	0.4

PLOT WG2	1996	1999
SOIL		70.2
ROCK		5.5
BARE	75.8	75.7
LITTER	1	8.2
PRGL	13	4.9
TARBUSH	6.5	1.2
4WING	0.3	0
ACOU	0.2	0.1
ANN FORB	0	7.3
ANN GRASS	0	1.5
GUSA	0	0.1
MUPO BAS	0	0
MUPO CAN	0	0
SEMA BAS	0	0
SEMA CAN	0	0.8

PLOT WG3
DATE OCT 8 96

	1	2	3	4	5	6	7	8	9	10	MEAN	S.E.
BARE	66	78	67	68	68	62	64	66	62	62	66.3	1.5
LITTER	3	2	5	5	3	6	7	9	2	5	4.7	0.7
FORB	0	0	0	0	0	0	0	0	0	0	0	0.0
ANN GRASS	0	0	0	0	0	0	0	0	0	0	0	0.0
PRGL	23	8	20	16	16	18	18	12	22	25	17.8	1.6
TARBUSH	8	14	11	11	15	15	14	12	14	8	12.2	0.8
SEMA	0	0	0	0	0	0	0	0	0	0	0	0.0
SEMA LF	1	0	0	0	0	0	0	0	0	0	0.1	0.1
GUSA	1	2	0	0	0	0	0	0	0	0	0.3	0.2

PLOT WG3
DATE 21-Sep-99

	1	2	3	4	5	6	7	8	9	10	MEAN	S.E.
SOIL	46	49	53	49	54	53	59	55	53	44	51.5	1.4
ROCK	3	11	13	16	7	2	4	6	7	13	8.2	1.5
BARE	49	60	66	65	61	55	63	61	60	57	59.7	1.6
LITTER	10	12	8	6	9	10	7	11	5	7	8.5	0.7
FORB	18	9	4	2	2	12	11	3	6	7	7.4	1.6
ANN GRASS	2	0	3	3	1	1	0	0	1	1	1.2	0.4
PRGL	2	0	4	3	4	5	0	10	10	4	4.2	1.1
TARBUSH	1	5	3	5	3	2	0	3	5	1	2.8	0.6
SEMA BAS	2	2	0	2	4	5	2	1	1	1	2	0.5
SEMA CAN	19	17	8	16	21	18	19	11	13	25	16.7	1.6
GUSA	2	0	0	0	0	0	0	0	0	0	0.2	0.2

PLOT WG3	1996	1999
SOIL		51.5
ROCK		8.2
BARE	66.3	59.7
LITTER	4.7	8.5
PRGL	17.8	4.2
TARBUSH	12.2	2.8
GUSA	0.3	0.2
SEMA CAN	0.1	16.7
ANN FORB	0	7.4
ANN GRASS	0	1.2
SEMA BAS	0	2

PLOT WG4
DATE 9-Oct-96

	1	2	3	4	5	6	7	8	9	10	MEAN	S.E.
BARE	57	60	73	49	59	61	70	53	57	57	59.6	2.3
LITTER	3	8	5	9	13	6	4	7	4	10	6.9	1.0
FORB	2	1	3	0	0	0	0	0	0	0	0.6	0.3
ANN GRASS	0	0	0	0	0	0	0	0	0	0	0	0.0
WHITETHORN	3	0	0	0	0	0	0	0	0	0	0.3	0.3
PRGL	22	21	15	21	22	21	17	26	17	16	19.8	1.1
TARBUSH	20	13	7	14	7	17	11	17	18	6	13	1.6
GUSA	2	1	1	1	4	5	0	0	0	0	1.4	0.6
MUPO BAS	1	2	0	0	0	0	0	0	0	0	0.3	0.2
MUPO CAN	1	3	1	2	3	3	1	0	0	0	1.4	0.4
HIMU BAS	0	0	0	0	0	0	0	0	0	0	0	0.0
HIMU CAN	1	0	0	0	0	0	0	0	0	0	0.1	0.1
ARIS BAS	0	0	0	0	0	0	0	0	0	0	0	0.0
ARIS CAN	3	3	0	0	0	0	0	0	0	0	0.6	0.4
BOER BAS	0	0	0	0	0	0	0	0	0	0	0	0.0
BOER CAN	1	1	0	0	0	0	0	0	0	0	0.2	0.1
DICA BAS	0	0	0	0	0	0	0	0	0	0	0	0.0
DICA CAN	2	0	0	0	0	0	0	0	0	0	0.2	0.2
LARREA	1	0	0	0	0	0	0	0	0	0	0.1	0.1
SEMA BAS	0	0	0	0	0	0	0	0	0	0	0	0.0
SEMA CAN	1	0	0	0	0	0	0	0	0	0	0.1	0.1

PLOT WG4
DATE 21-Sep-99

	1	2	3	4	5	6	7	8	MEAN	S.E.
SOIL	52	60	47	34	65	52	47	40	49.6	3.5
ROCK	13	7	15	17	5	9	11	6	10.4	1.5
BARE	65	67	62	51	70	61	58	46	60.0	2.9
LITTER	5	5	4	7	4	5	5	10	5.6	0.7
FORB	0	0	1	10	0	0	1	7	2.4	1.4
ANN GRASS	0	0	0	0	0	0	0	1	0.1	0.1
WHITETHORN	0	0	0	0	1	0	0	9	1.3	1.1
PRGL	7	16	9	14	14	18	21	15	14.3	1.6
TARBUSH	21	14	15	14	13	15	15	10	14.6	1.1
GUSA	0	0	4	5	3	1	1	6	2.5	0.8
MUPO BAS	0	0	0	0	0	1	1	0	0.3	0.2
MUPO CAN	1	0	2	1	0	5	2	1	1.5	0.6
HIMU BAS	0	0	0	0	0	0	0	0	0.0	0
HIMU CAN	0	0	0	0	0	0	0	0	0.0	0
ARIS BAS	0	0	0	0	0	0	0	0	0.0	0
ARIS CAN	0	0	1	0	0	0	0	7	1.0	0.9
BOER BAS	0	0	0	0	0	0	0	0	0.0	0
BOER CAN	0	0	0	0	0	0	0	0	0.0	0
DICA BAS	0	0	0	0	0	0	0	0	0.0	0
DICA CAN	0	0	0	0	0	0	0	0	0.0	0
LARREA	0	0	0	0	0	0	0	0	0.0	0
SEMA BAS	0	0	0	1	0	0	0	0	0.1	0.1
SEMA CAN	0	0	1	4	0	0	0	4	1.1	0.6

PLOT WG4	1996	1999
SOIL		49.6
ROCK		10.4
BARE	59.6	60.0
LITTER	6.9	5.6
PRGL	19.8	14.3
TARBUSH	13.0	14.6
GUSA	1.4	2.5
MUPO CAN	1.4	1.5
ANN FORB	0.6	2.4
ARIS CAN	0.6	1.0
WHITETHORN	0.3	1.3
MUPO BAS	0.3	0.3
BOER CAN	0.2	0.0
DICA CAN	0.2	0.0
HIMU CAN	0.1	0.0
LARREA	0.1	0.0
SEMA CAN	0.1	1.1
ANN GRASS	0.0	0.1
HIMU BAS	0.0	0.0
ARIS BAS	0.0	0.0
BOER BAS	0.0	0.0
DICA BAS	0.0	0.0
SEMA BAS	0.0	0.1

PLOT WG5
DATE OCT 9 96

	1	2	3	4	5	6	7	8	9	10	MEAN	S.E.
BARE	28	36	38	46	46	59	39	62	48	61	46.3	3.6
LITTER	6	15	13	13	11	8	8	3	9	11	9.7	1.1
FORB	5	4	6	2	0	0	2	1	2	0	2.2	0.7
ANN GRASS	27	20	19	14	14	4	20	6	18	5	14.7	2.4
WHITETHORN	10	8	15	12	11	9	15	9	17	10	11.6	1.0
PRGL	2	6	3	2	2	1	2	5	1	1	2.5	0.5
TARBUSH	0	0	0	1	7	2	0	0	1	3	1.4	0.7
GUSA	4	5	6	4	2	8	2	1	3	3	3.8	0.7
MUPO BAS	0	0	0	0	0	0	0	0	0	0	0	0.0
MUPO CAN	2	5	2	2	0	0	0	0	0	0	1.1	0.5
HIMU BAS	3	1	2	0	0	0	3	2	3	0	1.4	0.4
HIMU CAN	22	10	3	0	0	0	20	15	3	0	7.3	2.8
ARIS BAS	0	0	0	0	0	0	0	0	0	0	0	0.0
ARIS CAN	1	7	9	11	7	6	2	1	1	4	4.9	1.2
PAOB BAS	0	0	0	0	0	0	0	0	0	0	0	0.0
PAOB CAN	2	1	0	0	0	0	0	0	0	0	0.3	0.2
YUEL	1	2	1	0	0	0	0	0	0	0	0.4	0.2
SOEL	1	2	0	0	0	0	0	0	0	0	0.3	0.2
ISTE	1	0	0	0	0	0	0	0	0	0	0.1	0.1

PLOT WG5
DATE 21-Sep-99

	1	2	3	4	5	6	7	8	9	10	MEAN	S.E.
SOIL	43	41	33	28	38	32	26	28	24	19	31.2	2.4
ROCK	3	3	7	5	2	1	4	4	11	2	4.2	0.9
BARE	46	44	40	33	40	33	30	32	35	21	35.4	2.3
LITTER	4	5	5	4	7	4	9	3	10	4	5.5	0.7
FORB	19	14	19	20	23	19	18	20	12	19	18.3	1.0
ANN GRASS	17	13	20	27	13	16	21	34	27	33	22.1	2.5
WHITETHORN	5	5	6	9	6	6	5	1	11	4	5.8	0.9
PRGL	1	2	0	0	0	0	0	0	0	0	0.3	0.2
TARBUSH	3	1	1	0	0	0	0	0	0	0	0.5	0.3
GUSA	7	7	6	7	5	9	5	7	10	9	7.2	0.5
MUPO BAS	0	0	0	0	0	0	0	0	0	0	0	0.0
MUPO CAN	0	2	1	2	0	0	0	0	0	0	0.5	0.3
HIMU BAS	0	0	0	0	0	0	0	2	0	15	1.7	1.5
HIMU CAN	0	0	0	0	0	2	0	5	0	3	1	0.6
ARIS BAS	0	0	0	0	0	0	0	0	0	0	0	0.0
ARIS CAN	2	0	0	0	1	0	3	0	4	0	1	0.5
PAOB BAS	0	0	0	0	0	0	0	0	0	0	0	0.0
PAOB CAN	0	0	0	0	0	0	0	0	1	0	0.1	0.1
YUEL	0	0	0	0	0	0	0	0	0	0	0	0.0
SOEL	0	2	0	0	0	0	2	1	0	0	0.5	0.3
ISTE	2	0	0	0	0	0	0	0	0	0	0.2	0.2
SEMA BAS	1	1	1	0	0	1	0	0	0	0	0.4	0.2
SEMA CAN	6	7	8	2	6	18	14	3	1	3	6.8	1.7

PLOT WG5	1996	1999
SOIL		31.2
ROCK		4.2
BARE	46.3	35.4
LITTER	9.7	5.5
ANN GRASS	14.7	22.1
WHITETHORN	11.6	5.8
HIMU CAN	7.3	1
ARIS CAN	4.9	1
GUSA	3.8	7.2
PRGL	2.5	0.3
ANN FORB	2.2	18.3
TARBUSH	1.4	0.5
HIMU BAS	1.4	1.7
MUPO CAN	1.1	0.5
YUEL	0.4	0
PAOB CAN	0.3	0.1
SOEL	0.3	0.5
ISTE	0.1	0.2
MUPO BAS	0	0
ARIS BAS	0	0
PAOB BAS	0	0
SEMA BAS	0	0.4
SEMA CAN	0	6.8

PLOT WG6
DATE OCT 9 96

	1	2	3	4	5	6	7	8	9	10	MEAN	S.E.
BARE	47	60	58	64	57	60	46	68	56	64	58.0	2.2
LITTER	9	5	6	8	11	4	11	4	9	5	7.2	0.9
ANN GRASS	1	0	0	0	0	0	0	0	0	0	0.1	0.1
WHITETHORN	5	2	0	1	8	8	3	0	0	6	3.3	1.0
PRGL	12	14	12	17	6	22	16	13	19	6	13.7	1.6
TARBUSH	5	15	9	9	9	10	11	9	12	10	9.9	0.8
GUSA	5	3	9	1	8	2	6	5	5	6	5.0	0.8
MUPO BAS	1	1	1	0	0	0	0	0	0	0	0.3	0.2
MUPO CAN	7	12	5	6	7	7	4	9	1	4	6.2	1.0
HIMU BAS	2	0	0	0	0	0	0	0	0	0	0.2	0.2
HIMU CAN	4	0	0	0	0	0	0	0	0	0	0.4	0.4
ARIS BAS	0	0	0	0	0	0	0	0	0	0	0.0	0.0
ARIS CAN	2	5	0	0	0	0	0	0	0	0	0.7	0.5
SEMA BAS	0	0	0	0	0	0	0	0	0	0	0.0	0.0
SEMA CAN	2	1	1	1	0	0	0	0	0	0	0.5	0.2
4WING	2	1	4	0	0	0	0	0	0	0	0.7	0.4
SPWR BAS	0	0	0	0	0	0	0	0	0	0	0.0	0.0
SPWR CAN	2	0	0	0	0	0	0	0	0	0	0.2	0.2
PAOB BAS	0	0	0	0	0	0	0	0	0	0	0.0	0.0
PAOB CAN	2	1	0	0	0	0	0	0	0	0	0.3	0.2
ACOUTRIA	1	0	0	0	0	0	0	0	0	0	0.1	0.1

PLOT WG6
DATE 22-Sep-99

	1	2	3	4	5	6	7	8	MEAN	S.E.
SOIL	35	50	56	57	42	56	52	55	50.4	2.8
ROCK	11	7	8	9	4	4	9	9	7.6	0.9
BARE	46	57	64	66	46	60	61	64	58.0	2.8
LITTER	6	4	6	4	6	5	5	6	5.3	0.3
ANN GRASS	14	4	1	1	10	0	0	0	3.8	1.9
WHITETHORN	4	2	1	0	5	2	5	5	3.0	0.7
PRGL	16	16	6	8	18	9	6	14	11.6	1.7
TARBUSH	6	9	18	14	5	14	14	9	11.1	1.6
GUSA	3	2	2	1	4	1	3	2	2.3	0.4
MUPO BAS	0	2	1	0	1	1	0	1	0.8	0.2
MUPO CAN	5	5	10	9	8	7	6	4	6.8	0.7
HIMU BAS	2	0	0	0	0	0	0	0	0.3	0.2
HIMU CAN	10	3	0	0	2	0	0	0	1.9	1.2
ARIS BAS	0	0	0	0	0	0	0	0	0.0	0
ARIS CAN	1	2	0	0	0	0	0	0	0.4	0.3
SEMA BAS	0	0	0	0	0	0	0	1	0.1	0.1
SEMA CAN	2	0	1	0	2	0	2	1	1.0	0.3
4WING	1	1	0	0	0	0	0	0	0.3	0.2
SPWR BAS	0	0	0	0	0	0	0	0	0.0	0
SPWR CAN	0	0	0	0	0	0	0	0	0.0	0
PAOB BAS	0	0	0	0	0	0	0	0	0.0	0
PAOB CAN	1	0	1	0	0	4	0	0	0.8	0.5
ACOUTRIA	1	1	1	1	0	0	0	0	0.5	0.2
ANN FORB	2	6	2	1	4	0	2	0	2.1	0.7

PLOT WG6	1996	1999
SOIL		50.4
ROCK		7.6
BARE	58	58.0
LITTER	7.2	5.3
PRGL	13.7	11.6
TARBUSH	9.9	11.1
MUPO CAN	6.2	6.8
GUSA	5	2.3
WHITETHORN	3.3	3.0
ARIS CAN	0.7	0.4
4WING	0.7	0.3
SEMA CAN	0.5	1.0
HIMU CAN	0.4	1.9
MUPO BAS	0.3	0.8
PAOB CAN	0.3	0.8
HIMU BAS	0.2	0.3
SPWR CAN	0.2	0.0
ANN GRASS	0.1	3.8
ACOUTRIA	0.1	0.5
ARIS BAS	0	0.0
SEMA BAS	0	0.1
SPWR BAS	0	0.0
PAOB BAS	0	0.0
ANN FORB	0	2.1

PLOT WG7
DATE OCT 9 96

	1	2	3	4	5	6	7	8	9	10	MEAN	S.E.
BARE	28	67	65	64	55	39	58	67	54	48	54.5	4.1
LITTER	16	10	9	5	9	0	5	4	7	6	7.1	1.4
ANN FORB	5	0	1	2	0	1	2	1	0	0	1.2	0.5
ANN GRASS	3	1	1	2	2	0	0	0	0	0	0.9	0.3
WHITETHORN	12	11	6	7	10	6	10	8	8	13	9.1	0.8
PRGL	20	8	12	11	10	16	15	10	14	15	13.1	1.1
TARBUSH	3	3	9	8	11	0	4	6	4	8	5.6	1.1
GUSA	10	6	1	3	5	8	4	5	0	0	4.2	1.1
MUPO BAS	1	1	1	2	2	0	0	0	0	0	0.7	0.3
MUPO CAN	13	7	7	5	12	6	2	5	6	8	7.1	1.0
HIMU BAS	1	2	1	0	0	0	0	0	0	0	0.4	0.2
HIMU CAN	21	5	9	0	0	0	0	0	0	0	3.5	2.2
ARIS BAS	0	0	0	0	0	0	0	0	0	0	0	0.0
ARIS CAN	1	0	0	0	0	0	0	0	0	0	0.1	0.1
SEMA BAS	0	0	0	0	0	0	0	0	0	0	0	0.0
SEMA CAN	2	1	1	1	0	0	0	0	0	0	0.5	0.2
4WING	1	0	0	0	0	0	0	0	0	0	0.1	0.1
PAOB BAS	1	0	0	0	0	0	0	0	0	0	0.1	0.1
PAOB CAN	2	0	0	0	0	0	0	0	0	0	0.2	0.2
DICA BAS	0	0	0	0	0	0	0	0	0	0	0	0.0
DICA CAN	1	2	1	1	0	0	0	0	0	0	0.5	0.2
OPSPI	1	0	0	0	0	0	0	0	0	0	0.1	0.1
SOEL	1	0	0	0	0	0	0	0	0	0	0.1	0.1

PLOT WG7
DATE 22-Sep-99

	1	2	3	4	5	6	7	8	9	10	MEAN	S.E.
SOIL	22	21	28	50	38	38	43	42	45	25	35.2	3.3
ROCK	8	12	8	11	4	5	9	8	10	4	7.9	0.9
BARE	30	33	36	61	42	43	52	50	55	29	43.1	3.5
LITTER	12	7	9	11	14	8	10	7	10	4	9.2	0.9
ANN FORB	22	27	35	13	22	29	17	29	17	45	25.6	3.0
ANN GRASS	11	4	8	3	7	9	11	11	3	16	8.3	1.3
WHITETHORN	5	11	7	3	9	1	5	7	4	3	5.5	1.0
PRGL	3	8	1	5	4	6	8	4	6	9	5.4	0.8
TARBUSH	3	3	2	0	0	0	2	0	2	0	1.2	0.4
GUSA	4	4	0	2	2	0	0	3	0	1	1.6	0.5
MUPO BAS	1	1	1	0	0	0	0	0	0	0	0.3	0.2
MUPO CAN	3	10	2	2	0	0	0	0	0	0	1.7	1.0
HIMU BAS	2	0	0	0	0	0	0	0	0	0	0.2	0.2
HIMU CAN	3	0	0	0	0	0	0	0	0	9	1.2	0.9
ARIS BAS	0	0	0	0	0	0	0	0	0	0	0	0.0
ARIS CAN	3	0	0	0	0	0	0	0	0	0	0.3	0.3
SEMA BAS	1	1	1	2	0	0	0	1	1	1	0.8	0.2
SEMA CAN	13	9	5	6	3	3	6	6	8	8	6.7	0.9
4WING	0	0	0	0	0	0	0	0	0	0	0	0.0
PAOB BAS	0	0	0	0	0	0	0	0	0	0	0	0.0
PAOB CAN	1	2	0	0	0	0	0	0	0	0	0.3	0.2
DICA BAS	0	0	0	0	0	0	0	0	0	0	0	0.0
DICA CAN	0	0	0	0	0	0	0	0	0	0	0	0.0
OPSPI	0	0	0	0	0	0	0	0	0	0	0	0.0
SOEL	1	0	1	0	1	0	0	0	0	0	0.3	0.2

PLOT WG7	1996	1999
SOIL		35.2
ROCK		7.9
BARE	54.5	43.1
LITTER	7.1	9.2
PRGL	13.1	5.4
WHITETHORN	9.1	5.5
MUPO CAN	7.1	1.7
TARBUSH	5.6	1.2
GUSA	4.2	1.6
HIMU CAN	3.5	1.2
ANN FORB	1.2	25.6
ANN GRASS	0.9	8.3
MUPO BAS	0.7	0.3
SEMA CAN	0.5	6.7
DICA CAN	0.5	0
HIMU BAS	0.4	0.2
PAOB CAN	0.2	0.3
ARIS CAN	0.1	0.3
4WING	0.1	0
PAOB BAS	0.1	0
OPSPI	0.1	0
SOEL	0.1	0.3
ARIS BAS	0	0
SEMA BAS	0	0.8
DICA BAS	0	0

PLOT	WG 8											
DATE	Oct 8, 1996											
	1	2	3	4	5	6	7	8	9	10	mean	S.E.
BARE	50	55	50	50	45	58	32	61	30	39	47.0	3.3
LITTER	9	9	9	8	11	5	12	3	11	7	8.4	0.9
FORB	0	1	4	8	12	1	5	3	17	16	6.7	2.0
PRGL	16	15	5	5	1	12	12	7	4	4	8.1	1.7
ANN GRAS	0	0	3	7	11	0	2	11	12	10	5.6	1.6
TARBUSH	0	0	2	0	0	0	0	0	0	0	0.2	0.2
GUSA	5	3	3	3	5	3	3	1	7	2	3.5	0.5
MUPO BAS	1	0	0	0	1	0	0	0	0	0	0.2	0.1
MUPO CAN	3	4	2	4	3	8	16	2	7	2	5.1	1.4
WHITETHORN	18	17	14	18	11	17	18	9	12	6	14.0	1.4
DICA BAS	1	0	1	0	1	0	1	0	0	0	0.4	0.2
DICA CAN	0	0	3	0	2	0	1	1	0	0	0.7	0.3
ARIS BAS	0	0	0	0	0	0	1	0	0	0	0.1	0.1
ARIS CAN	0	2	0	2	2	4	3	1	5	2	2.1	0.5
SEMA BAS	0	0	1	0	0	0	0	0	0	0	0.1	0.1
SEMA CAN	0	1	1	0	0	1	0	0	0	0	0.3	0.2
SOEL	0	1	0	0	0	0	0	0	0	0	0.1	0.1
HIMU BAS	0	0	0	0	0	0	1	2	0	0	0.3	0.2
HIMU CAN	0	0	5	1	2	0	5	7	3	2	2.5	0.8
CRCO	0	0	1	0	1	0	1	0	0	4	0.7	0.4
PAOB BAS	0	0	0	0	0	0	0	0	0	0	0.0	0.0
PAOB CAN	0	0	2	0	0	0	1	1	1	0	0.5	0.2
BORAD BAS	0	0	0	0	0	0	0	0	0	2	0.2	0.2
BORAD CAN	0	0	0	0	1	1	0	0	1	5	0.8	0.5
OPSPI	0	0	0	0	0	0	0	0	1	1	0.2	0.1
BOER BAS	0	0	0	0	0	0	0	0	0	0	0.0	0.0
BOER CAN	0	0	0	0	0	0	0	0	0	2	0.2	0.2

PLOT	WG 8											
DATE	22-Sep-99											
	1	2	3	4	5	6	7	8	9	10	mean	S.E.
SOIL	35	36	21	30	17	32	33	21	27	14	26.6	2.5
ROCK	9	16	7	14	11	7	8	7	8	5	9.2	1.1
BARE	44	52	28	44	28	39	41	28	35	19	35.8	3.2
LITTER	10	11	9	1	5	5	2	7	1	4	5.5	1.2
ANN FORB	12	21	35	21	31	22	21	32	26	43	26.4	2.8
PRGL	8	6	3	5	5	2	8	7	6	1	5.1	0.8
ANN GRAS	2	3	6	3	6	5	6	12	7	16	6.6	1.4
TARBUSH	2	1	0	0	0	0	0	0	0	0	0.3	0.2
GUSA	7	4	16	14	15	13	9	12	13	11	11.4	1.2
MUPO BAS	0	0	0	0	0	0	1	0	0	0	0.1	0.1
MUPO CAN	8	1	1	1	2	1	7	0	2	0	2.3	0.9
WHITETHORN	16	6	9	16	9	14	11	18	11	2	11.2	1.6
DICA BAS	0	0	0	0	0	0	0	0	0	0	0.0	0.0
DICA CAN	1	0	0	0	0	0	0	0	0	0	0.1	0.1
ARIS BAS	0	0	0	0	1	0	0	0	0	0	0.1	0.1
ARIS CAN	1	0	4	1	4	0	3	5	5	3	2.6	0.6
SEMA BAS	0	0	0	0	0	0	0	0	0	0	0.0	0.0
SEMA CAN	1	2	0	0	0	0	0	0	0	0	0.3	0.2
SOEL	1	1	2	0	0	0	0	0	0	0	0.4	0.2
HIMU BAS	0	0	1	0	0	1	0	2	0	0	0.4	0.2
HIMU CAN	0	0	4	2	7	8	0	6	0	4	3.1	1.0
CRCO	0	0	2	0	3	1	0	2	1	0	0.9	0.3
PAOB BAS	0	0	0	0	0	0	0	0	0	0	0.0	0.0
PAOB CAN	3	1	0	0	0	0	0	0	0	0	0.4	0.3
BORAD BAS	0	0	0	0	0	0	0	0	0	0	0.0	0.0
BORAD CAN	3	5	1	8	0	0	0	0	0	0	1.7	0.9
OPSPI	0	0	0	0	0	0	0	0	0	0	0.0	0.0
BOER BAS	0	0	0	0	0	0	0	0	0	0	0.0	0.0
BOER CAN	0	0	0	0	0	0	0	0	0	0	0.0	0.0

PLOT WG8	1996	1999
SOIL		26.6
ROCK		9.2
BARE	47.0	35.8
LITTER	8.4	5.5
WHITETHORN	14.0	11.2
PRGL	8.1	5.1
ANN FORB	6.7	26.4
ANN GRAS	5.6	6.6
MUPO CAN	5.1	2.3
GUSA	3.5	11.4
HIMU CAN	2.5	3.1
ARIS CAN	2.1	2.6
BORAD CAN	0.8	1.7
DICA CAN	0.7	0.1
CRCO	0.7	0.9
PAOB CAN	0.5	0.4
DICA BAS	0.4	0
SEMA CAN	0.3	0.3
HIMU BAS	0.3	0.4
TARBUSH	0.2	0.3
MUPO BAS	0.2	0.1
BORAD BAS	0.2	0
OPSPI	0.2	0
BOER CAN	0.2	0
ARIS BAS	0.1	0.1
SEMA BAS	0.1	0
SOEL	0.1	0.4
PAOB BAS	0	0
BOER BAS	0	0

PLOT WG 9
DATE Oct 9, 1996

	1	2	3	4	5	6	7	8	9	10	mean	S.E.
BARE	69	62	72	75	65	41	56	63	63	47	61.3	3.4
LITTER	4	6	7	5	12	10	5	16	11	20	9.6	1.7
FORB	0	3	1	2	3	1	1	5	1	1	1.8	0.5
PRGL	0	0	0	0	0	1	1	0	0	0	0.2	0.1
ANN GRAS	10	5	2	7	22	18	7	0	3	5	7.9	2.2
WHITETH	8	17	6	14	14	13	4	3	12	19	11.0	1.7
HIMU BAS	0	0	0	0	0	0	0	0	0	0	0.0	0.0
HIMU CAN	3	0	0	0	5	0	0	0	0	0	0.8	0.6
GUSA	5	1	1	3	4	1	4	5	1	8	3.3	0.7
ARIS BAS	1	0	0	0	0	0	0	0	0	0	0.1	0.1
ARIS CAN	2	0	0	0	0	0	0	0	0	1	0.3	0.2
DAPU BAS	0	1	0	2	0	0	0	0	0	0	0.3	0.2
DAPU CAN	0	2	1	3	0	0	1	1	0	0	0.8	0.3
PAPERFLR	0	1	2	1	0	0	0	2	2	1	0.9	0.3
TARBUSH	0	3	5	1	0	0	4	1	5	0	1.9	0.7
LARREA	0	0	0	0	1	0	1	3	0	0	0.5	0.3
HODE	0	0	0	0	0	0	0	1	0	0	0.1	0.1

PLOT WG 9
DATE 23-Sep-99

	1	2	3	4	5	6	7	8	9	10	mean	S.E.
SOIL	35	35	42	49	42	46	37	51	40	44	42.1	1.8
ROCK	3	3	4	10	10	3	12	3	6	9	6.3	1.1
BARE	38	38	46	59	52	49	49	54	46	53	48.4	2.1
LITTER	6	3	8	5	3	6	6	11	8	4	6.0	0.8
FORB	15	19	19	19	11	20	21	15	20	19	17.8	1.0
PRGL	1	0	0	0	0	0	0	0	0	0	0.1	0.1
ANN GRAS	19	19	14	15	21	14	13	9	6	14	14.4	1.4
WHITETH	7	5	9	0	7	7	4	1	5	2	4.7	0.9
HIMU BAS	0	0	0	0	0	0	0	0	0	0	0.0	0.0
HIMU CAN	2	0	0	0	0	0	0	0	0	0	0.2	0.2
GUSA	7	11	3	6	8	1	6	4	8	5	5.9	0.9
ARIS BAS	0	0	0	0	0	0	0	0	0	0	0.0	0.0
ARIS CAN	1	1	1	0	0	0	0	0	0	0	0.3	0.2
DAPU BAS	0	0	0	0	0	0	0	0	0	0	0.0	0.0
DAPU CAN	0	0	0	0	0	0	0	0	0	0	0.0	0.0
PAPERFLR	0	0	0	0	0	0	0	0	0	0	0.0	0.0
TARBUSH	0	0	0	0	0	0	0	0	0	0	0.0	0.0
LARREA	0	0	0	0	0	0	0	0	0	0	0.0	0.0
HODE	0	0	0	1	0	0	1	2	2	1	0.7	0.3

PLOT WG9	1996	1999
SOIL		42.1
ROCK		6.3
BARE	61.3	48.4
LITTER	9.6	6.0
WHITETH	11.0	4.7
ANN GRAS	7.9	14.4
GUSA	3.3	5.9
TARBUSH	1.9	0
ANN FORB	1.8	17.8
PAPERFLR	0.9	0
HIMU CAN	0.8	0.2
DAPU CAN	0.8	0
LARREA	0.5	0
ARIS CAN	0.3	0.3
DAPU BAS	0.3	0
PRGL	0.2	0.1
ARIS BAS	0.1	0
HODE	0.1	0.7
HIMU BAS	0.0	0

PLOT WG 10
DATE Oct 14, 1996

	1	2	3	4	5	6	7	8	9	10	mean	S.E.
BARE	71	73	58	45	43	61	51	47	53	37	53.9	3.8
LITTER	10	7	9	5	10	12	4	14	10	10	9.1	1.0
FORB	1	0	1	0	6	3	0	1	2	7	2.1	0.8
PRGL	0	0	0	3	2	0	3	1	1	4	1.4	0.5
ANN GRAS	3	3	17	17	12	4	3	14	12	27	11.2	2.5
WHITETH	8	13	10	12	12	10	30	14	11	3	12.3	2.2
HIMU BAS	0	0	0	0	0	0	0	0	0	1	0.1	0.1
HIMU CAN	0	0	1	1	0	0	1	2	0	4	0.9	0.4
GUSA	2	1	2	4	9	8	1	3	6	5	4.1	0.9
MUPO BAS	0	0	0	0	0	0	0	0	0	0	0.0	0.0
MUPO CAN	0	0	0	0	0	1	0	0	0	1	0.2	0.1
ARIS BAS	0	0	0	1	0	1	0	0	0	1	0.3	0.2
ARIS CAN	3	0	2	8	6	5	0	2	3	9	3.8	1.0
MIBI	1	0	0	0	0	0	0	0	0	0	0.1	0.1
PAOB BAS	0	0	0	0	0	0	0	0	0	0	0.0	0.0
PAOB CAN	0	0	0	0	0	0	0	4	0	0	0.4	0.4
TARBUSH	0	0	0	0	1	0	0	0	1	2	0.4	0.2
SEMA BAS	0	0	0	0	0	0	0	0	0	0	0.0	0.0
SEMA CAN	0	0	0	0	1	1	0	0	0	0	0.2	0.1
DICA BAS	0	0	0	0	0	0	0	0	0	0	0.0	0.0
DICA CAN	0	0	0	0	0	0	0	1	0	0	0.1	0.1

PLOT WG 10
DATE 23-Sep-99

	1	2	3	4	5	6	7	8	9	10	mean	S.E.
SOIL	36	61	40	47	33	41	42	33	39	18	39.0	3.5
ROCK	1	4	1	4	2	3	3	1	1	0	2.0	0.4
BARE	37	65	41	51	35	44	45	34	40	18	41.0	3.8
LITTER	6	8	9	9	8	10	5	5	5	3	6.8	0.7
FORB	16	17	16	15	14	19	29	27	13	13	17.9	1.8
PRGL	0	0	2	2	0	0	0	0	2	1	0.7	0.3
ANN GRAS	33	8	32	12	31	21	21	31	9	56	25.4	4.6
WHITETH	3	1	5	6	9	4	4	9	10	5	5.6	0.9
HIMU BAS	1	0	0	0	0	0	0	0	0	0	0.1	0.1
HIMU CAN	1	1	0	0	0	0	0	0	0	0	0.2	0.1
GUSA	2	2	1	6	4	2	0	2	12	9	4.0	1.2
MUPO BAS	0	0	0	0	0	0	0	0	0	0	0.0	0.0
MUPO CAN	0	2	0	3	0	0	0	0	0	2	0.7	0.4
ARIS BAS	0	0	0	0	0	0	0	0	0	1	0.1	0.1
ARIS CAN	1	0	2	7	3	1	0	1	7	7	2.9	0.9
MIBI	0	0	0	0	0	0	0	0	0	0	0.0	0.0
PAOB BAS	1	0	0	0	0	0	0	0	0	0	0.1	0.1
PAOB CAN	3	0	1	0	0	0	0	0	1	0	0.5	0.3
TARBUSH	0	0	0	0	1	0	0	0	0	0	0.1	0.1
SEMA BAS	0	0	0	0	0	0	0	0	0	0	0.0	0.0
SEMA CAN	1	1	0	0	0	0	0	0	0	0	0.2	0.1
DICA BAS	0	0	0	0	0	0	0	0	0	0	0.0	0.0
DICA CAN	0	0	0	0	0	0	0	0	0	0	0.0	0.0

PLOT WG1C	1996	1999
SOIL		39.0
ROCK		2.0
BARE	53.9	41.0
LITTER	9.1	6.8
WHITETH	12.3	5.6
ANN GRAS	11.2	25.4
GUSA	4.1	4.0
ARIS CAN	3.8	2.9
ANN FORB	2.1	17.9
PRGL	1.4	0.7
HIMU CAN	0.9	0.2
PAOB CAN	0.4	0.5
TARBUSH	0.4	0.1
ARIS BAS	0.3	0.1
MUPO CAN	0.2	0.7
SEMA CAN	0.2	0.2
HIMU BAS	0.1	0.1
MIBI	0.1	0.0
DICA CAN	0.1	0.0
MUPO BAS	0	0.0
PAOB BAS	0	0.1
SEMA BAS	0	0.0
DICA BAS	0	0.0

PLOT WG 11
DATE Oct 15, 1996

	1	2	3	4	5	6	7	8	9	10	mean	S.E.
BARE	53	28	32	33	17	41	30	37	60	59	39.0	4.5
LITTER	5	10	11	13	5	11	14	6	9	6	9.0	1.1
FORB	3	9	5	4	15	7	5	4	4	6	6.2	1.1
PRGL	3	10	3	8	5	4	11	15	5	11	7.5	1.3
ANN GRAS	14	18	10	7	31	3	12	3	6	0	10.4	2.9
WHITETH	8	19	14	24	16	13	10	16	10	11	14.1	1.5
GUSA	3	5	1	1	5	0	0	2	0	2	1.9	0.6
ARIS BAS	0	0	0	0	0	0	0	0	0	0	0.0	0.0
ARIS CAN	10	2	1	1	9	0	0	3	0	2	2.8	1.2
MUPO BAS	0	0	0	1	1	0	2	0	1	0	0.5	0.2
MUPO CAN	1	4	1	6	7	3	8	1	4	7	4.2	0.9
HIMU BAS	2	0	6	0	0	1	4	3	1	0	1.7	0.7
HIMU CAN	4	4	19	12	0	17	15	27	4	3	10.5	2.8
SEMA BAS	0	0	0	0	0	0	0	0	0	0	0.0	0.0
SEMA CAN	2	1	0	1	2	0	0	0	0	0	0.6	0.3
PAOB BAS	0	0	2	1	0	5	0	0	0	0	0.8	0.5
PAOB CAN	0	4	10	0	7	6	4	1	1	0	3.3	1.1
BOCU BAS	0	0	0	0	0	0	0	0	0	0	0.0	0.0
BOCU CAN	0	0	1	0	0	0	0	0	0	0	0.1	0.1
DICA BAS	0	0	0	0	0	0	0	0	0	0	0.0	0.0
DICA CAN	0	0	2	2	3	2	4	2	1	0	1.6	0.4
LARREA	0	0	0	1	0	0	0	0	0	0	0.1	0.1
PPEAR	0	0	0	1	0	0	0	0	0	0	0.1	0.1
TARBUSH	0	0	0	2	0	0	0	0	0	0	0.2	0.2

PLOT WG 11
DATE 22-Sep-99

	1	2	3	4	5	6	7	8	mean	S.E.
SOIL	13	35	33	26	32	37	23	31	28.8	2.8
ROCK	8	9	5	2	3	5	5	3	5.0	0.9
BARE	21	44	38	28	35	42	28	34	33.8	2.7
LITTER	4	1	7	10	5	1	0	3	3.9	1.2
FORB	23	19	20	24	22	26	22	26	22.8	0.9
PRGL	4	3	10	11	5	9	6	9	7.1	1.1
ANN GRAS	11	6	2	17	14	7	35	24	14.5	3.8
WHITETH	31	23	17	15	11	20	17	13	18.4	2.2
GUSA	18	11	4	4	4	6	3	2	6.5	1.9
ARIS BAS	0	0	0	0	0	1	0	0	0.1	0.1
ARIS CAN	0	0	0	0	0	2	0	0	0.3	0.2
MUPO BAS	0	0	2	1	0	1	0	0	0.5	0.3
MUPO CAN	6	3	7	4	2	4	1	0	3.4	0.8
HIMU BAS	0	0	0	2	2	0	3	0	0.9	0.4
HIMU CAN	3	0	3	10	11	1	13	7	6.0	1.7
SEMA BAS	0	0	0	0	0	0	0	0	0.0	0
SEMA CAN	0	0	0	0	0	0	0	0	0.0	0
PAOB BAS	0	0	0	0	0	1	0	3	0.5	0.4
PAOB CAN	0	0	0	2	1	0	3	3	1.1	0.5
BOCU BAS	0	0	0	0	0	0	0	0	0.0	0
BOCU CAN	0	0	0	0	0	0	0	0	0.0	0
DICA BAS	0	0	0	0	0	0	0	0	0.0	0
DICA CAN	0	0	0	0	0	0	0	0	0.0	0
LARREA	0	0	0	0	0	0	0	0	0.0	0
PPEAR	0	0	0	0	0	0	0	0	0.0	0
TARBUSH	0	1	2	1	2	2	0	0	1.0	0.3

PLOT WG11	1996	1999
SOIL		28.8
ROCK		5.0
BARE	39.0	33.8
LITTER	9.0	3.9
WHITETH	14.1	18.4
HIMU CAN	10.5	6.0
ANN GRAS	10.4	14.5
PRGL	7.5	7.1
ANN FORB	6.2	22.8
MUPO CAN	4.2	3.4
PAOB CAN	3.3	1.1
ARIS CAN	2.8	0.3
GUSA	1.9	6.5
HIMU BAS	1.7	0.9
DICA CAN	1.6	0.0
PAOB BAS	0.8	0.5
SEMA CAN	0.6	0.0
MUPO BAS	0.5	0.5
TARBUSH	0.2	1.0
BOCU CAN	0.1	0.0
LARREA	0.1	0.0
PPEAR	0.1	0.0
ARIS BAS	0.0	0.1
SEMA BAS	0.0	0.0
BOCU BAS	0.0	0.0
DICA BAS	0.0	0.0

PLOT WG 12
DATE Oct 15, 1996

	1	2	3	4	5	6	7	8	9	10	mean	S.E.
BARE	27	33	28	42	42	34	32	53	41	43	37.5	2.6
LITTER	16	16	15	6	7	5	3	8	4	6	8.6	1.6
FORB	19	12	7	8	9	12	8	2	9	3	8.9	1.5
PRGL	5	6	6	1	2	8	2	3	3	6	4.2	0.7
ANN GRAS	22	18	34	17	24	32	44	22	29	24	26.6	2.6
WHITETH	9	4	7	14	14	12	14	8	8	10	10.0	1.1
GUSA	6	0	4	2	0	4	1	2	3	1	2.3	0.6
MUPO BAS	0	0	0	0	0	1	0	0	0	0	0.1	0.1
MUPO CAN	6	2	0	3	3	2	0	3	3	1	2.3	0.6
DICA BAS	0	0	0	0	0	0	0	0	0	0	0.0	0.0
DICA CAN	0	3	1	0	0	0	0	2	1	2	0.9	0.3
HIMU BAS	0	0	0	2	0	0	0	0	0	2	0.4	0.3
HIMU CAN	0	6	1	6	3	0	1	1	0	2	2.0	0.7
ARIS BAS	0	0	0	0	0	0	1	0	0	0	0.1	0.1
ARIS CAN	4	2	4	1	0	4	1	1	2	1	2.0	0.5
PAOB BAS	1	0	0	0	0	0	0	0	0	0	0.1	0.1
PAOB CAN	2	2	1	3	0	1	2	0	1	2	1.4	0.3
SEMA BAS	0	0	0	0	0	0	0	0	0	0	0.0	0.0
SEMA CAN	0	1	1	0	0	1	1	0	0	0	0.4	0.2
BORAD BAS	0	0	0	0	0	0	0	0	0	0	0.0	0.0
BORAD CAN	0	0	4	0	0	0	0	0	0	0	0.4	0.4
BOBA BAS	0	0	0	0	0	0	0	0	0	0	0.0	0.0
BOBA CAN	0	0	0	0	0	0	1	0	0	0	0.1	0.1
HODE	0	0	0	0	0	0	0	0	1	0	0.1	0.1
SOEL	0	0	0	0	0	0	0	0	0	1	0.1	0.1
SPWR BAS	0	0	0	0	0	0	0	0	0	1	0.1	0.1

PLOT	WG 12											
DATE	22-Sep-99											
	1	2	3	4	5	6	7	8	9	10	mean	S.E.
SOIL	13	21	22	18	18	14	19	15	20	11	17.1	1.2
ROCK	7	1	2	0	3	4	5	7	0	2	3.1	0.8
BARE	20	22	24	18	21	18	24	22	20	13	20.2	1.0
LITTER	4	5	1	6	3	2	4	3	2	5	3.5	0.5
ANN FORB	51	53	37	47	48	53	51	36	41	53	47.0	2.1
PRGL	4	2	6	1	3	2	5	0	0	8	3.1	0.8
ANN GRAS	12	19	15	32	25	24	12	31	43	43	25.6	3.7
WHITETH	15	5	10	7	12	8	9	5	1	8	8.0	1.2
GUSA	6	6	8	6	1	5	1	4	2	0	3.9	0.9
MUPO BAS	0	0	0	0	0	0	0	0	0	0	0.0	0.0
MUPO CAN	2	0	1	0	1	0	3	0	0	0	0.7	0.3
DICA BAS	0	0	0	0	0	0	0	0	0	0	0.0	0.0
DICA CAN	0	0	0	0	0	0	0	0	0	0	0.0	0.0
HIMU BAS	0	0	0	0	0	0	1	0	0	0	0.1	0.1
HIMU CAN	0	5	0	0	0	0	3	0	0	0	0.8	0.6
ARIS BAS	0	0	0	1	0	0	0	0	0	0	0.1	0.1
ARIS CAN	1	1	4	4	1	1	0	0	4	0	1.6	0.5
PAOB BAS	0	0	0	0	1	0	0	0	0	0	0.1	0.1
PAOB CAN	1	0	3	2	3	0	2	4	2	1	1.8	0.4
SEMA BAS	0	0	0	0	0	0	0	0	0	0	0.0	0.0
SEMA CAN	0	0	0	0	0	0	0	0	0	0	0.0	0.0
BORAD BAS	0	0	0	0	0	0	0	0	0	0	0.0	0.0
BORAD CAN	0	0	0	0	0	0	0	0	1	0	0.1	0.1
BOBA BAS	0	0	0	0	0	0	0	0	0	0	0.0	0.0
BOBA CAN	0	0	0	0	0	0	0	0	0	0	0.0	0.0
HODE	0	0	0	0	0	0	0	0	0	0	0.0	0.0
SOEL	1	1	1	0	0	0	0	0	0	0	0.3	0.2
SPWR BAS	0	0	0	0	0	0	0	0	0	0	0.0	0.0

PLOT WG12	1996	1999
SOIL		17.1
ROCK		3.1
BARE	37.5	20.2
LITTER	8.6	3.5
ANN GRAS	26.6	25.6
WHITETH	10.0	8.0
ANN FORB	8.9	47.0
PRGL	4.2	3.1
GUSA	2.3	3.9
MUPO CAN	2.3	0.7
HIMU CAN	2.0	0.8
ARIS CAN	2.0	1.6
PAOB CAN	1.4	1.8
DICA CAN	0.9	0.0
HIMU BAS	0.4	0.1
SEMA CAN	0.4	0.0
BORAD CAN	0.4	0.1
MUPO BAS	0.1	0.0
ARIS BAS	0.1	0.1
PAOB BAS	0.1	0.1
BOBA CAN	0.1	0.0
HODE	0.1	0.0
SOEL	0.1	0.3
SPWR BAS	0.1	0.0
DICA BAS	0.0	0.0
SEMA BAS	0.0	0.0
BORAD BAS	0.0	0.0
BOBA BAS	0.0	0.0

SUMMARY TABLE, ED ROOS RANCH SITE

PLOT ER1	1996	1999
SOIL		54.4
ROCK		1.3
BARE	63.1	55.7
LITTER	11.6	7.5
PRGL	13.6	7
ISTE	5.7	6.6
ANN FORB	1.4	15.8
ANN GRAS	1.3	3.2
EPHEDRA	1.1	0.2
YUEL	0.7	0.2
TAAU	0.7	0.9
MUPO CAN	0.7	0.1
SEMA CAN	0.3	5.1

PLOT ER2	1996	1999
SOIL		43.9
ROCK		2.3
BARE	50.2	46.1
PRGL	21.8	21.3
LITTER	13.9	7.9
ISTE	9.5	17.3
ANN FORB	2.7	5.8
ANN GRAS	2.0	0.6
MUPO CAN	1.7	2.0
EPHEDRA	0.9	0.9
GUSA	0.4	0.9
SOEL	0.2	0.0
ERLE CAN	0.2	0.0
SEMA CAN	0.2	1.1
ARIS CAN	0.1	0.0
ACOU	0.1	0.5

PLOT ER3	1996	1999
SOIL		27.1
ROCK		2.0
BARE	21.4	29.1
ANN GRAS	38.5	25.8
FORB	22.5	34.4
LITTER	8	5.6
ISTE	7.3	3.7
PRGL	5.9	3.9
MUPO CAN	4.2	1.1
SPCO CAN	1.5	0.3
EPHEDRA	1.2	0.6
SEMA CAN	0.8	1.8

PLOT ER4	1996	1999
SOIL		38.8
ROCK		2.6
BARE	36.9	41.4
LITTER	10.2	6.9
ANN GRAS	16.5	9.6
ANN FORB	13.7	32.9
ISTE	10.2	6.5
PRGL	9.3	3.5
MUPO CAN	2.3	0.4
SEMA CAN	1.3	1.6
ARIS CAN	1.1	0.1
SPCO CAN	1	0.1
EPHEDRA	0.6	0.2
CRCO	0.6	0
TAAU	0.4	0.2
DICA CAN	0.3	0.2
ARIS BAS	0.3	0
ERLE CAN	0.3	1.6

PLOT ER5	1996	1999
SOIL		38.4
ROCK		2.6
BARE	34.2	41.0
LITTER	8.6	3.9
ANN GRAS	24.2	11.6
ANN FORB	14.1	32.9
PRGL	12.6	5.9
ARIS CAN	3.0	0.3
MUPO CAN	2.2	0.7
ISTE	2.0	1.2
GUSA	1.7	3.3
SEMA CAN	1.2	0.7
EPHEDRA	0.8	0.3
TAAU	0.8	0.3
ERLE CAN	0.6	3.5

PLOT ER6	1996	1999
SOIL		41.8
ROCK		1.8
BARE	27.3	43.5
LITTER	8.7	5.8
ANN GRAS	22.6	5.6
ANN FORB	19.1	18.9
PRGL	7.1	4.6
ISTE	6.8	12.1
ERLE CAN	6.5	6.5
ARIS CAN	4.2	2.3
MUPO CAN	1.2	3.1
SEMA CAN	1.2	1.3
YUEL	1.1	0.5
EPHEDRA	1.0	0.6
ERLE BAS	0.7	0.1
GUSA	0.6	1.5

PLOT ER7	1996	1999
SOIL		48.4
ROCK		2.1
BARE	56.7	50.5
LITTER	14.3	6.7
PRGL	10.4	7.1
ISTE	8.1	6.9
ANN FORB	5.5	23.0
ANN GRAS	2.0	6.1
ERLE CAN	1.2	1.6
ARIS CAN	0.6	0.0
TAAU	0.5	0.3
EPHEDRA	0.4	0.1
GUSA	0.3	0.4
DAPU BAS	0.1	0.0
DAPU CAN	0.1	0.0
SEMA CAN	0.1	1.2

PLOT ER8	1996	1999
SOIL		39.6
ROCK		2.9
BARE	29.9	42.5
LITTER	11.9	4.6
ANN FORB	21.8	22.0
ANN GRAS	19.6	7.3
PRGL	10.0	11.5
ARIS CAN	3.3	1.5
ISTE	3.0	4.6
SPCO CAN	2.7	1.0
MUPO CAN	2.3	2.9
GUSA	1.2	6.6
EPHEDRA	1.1	0.1
SPCO BAS	0.6	0.0
SEMA CAN	0.4	3.0

PLOT ER9	1996	1999
SOIL		26.9
ROCK		8.4
BARE	17.2	35.3
LITTER	12.2	5.5
ANN GRAS	42.7	23.9
ANN FORB	29.1	34.3
PRGL	9.9	4.3
MUPO CAN	3.9	0.6
ISTE	3.5	1.7
EPHEDRA	2.4	1.0
ERLE CAN	0.8	0.1
GUSA	0.7	0.2
YUEL	0.7	0.2
DAPU CAN	0.5	0.0
SEMA CAN	0.3	1.6

PLOT ER10	1996	1999
SOIL		42.1
ROCK		3.5
BARE	33.5	45.6
LITTER	6.0	6.7
ANN FORB	13.7	27.2
PRGL	4.0	2.3
ANN GRAS	36.3	14.1
MUPO BAS	0.1	0.3
MUPO CAN	2.8	0.5
DICA BAS	0.0	0.1
DICA CAN	0.1	0.2
ISTE	7.6	5.7
ERLE BAS	0.0	0.0
ERLE CAN	0.2	0.2
ARIS BAS	0.1	0.0
ARIS CAN	1.5	0.3
YUEL	0.5	0.6
SEMA BAS	0.0	0.0
SEMA CAN	0.6	0.7

PLOT ER11	1996	1999
SOIL		37.6
ROCK		3.1
BARE	29.3	40.7
LITTER	10.5	8.3
ANN GRAS	25.3	9.0
ANN FORB	16.0	27.8
ISTE	8.5	4.7
ARIS CAN	4.6	1.2
PRGL	2.6	1.6
ERLE CAN	2.3	5.7
MUPO CAN	2.2	0.0
GUSA	1.8	1.3
SPCO CAN	1.6	0.3
EPHEDRA	0.9	0.3
YUEL	0.6	0.0
MUPO BAS	0.4	1.0

PLOT ER 12	1996	1999
SOIL		38.8
ROCK		1.6
BARE	24.7	40.4
LITTER	6.8	6.3
ANN GRAS	30.2	5.8
ANN FORB	20.6	19.8
ERLE CAN	7.2	10.4
ISTE	4.6	8.4
ARIS CAN	4.6	4.0
PRGL	3.6	3.3
MUPO CAN	1.6	2.1
GUSA	1.5	2.9
CRCO	0.7	0.1
SEMA CAN	0.6	1.1
ARIS BAS	0.5	0.5
YUEL	0.5	0.5

PLOT	ER1										
DATE	9/26/96										
	1	2	3	4	5	6	7	8	9	10	mean
BARE	66	71	72	63	49	57	71	63	58	61	63.1
LITTER	9	5	10	11	9	18	8	15	9	22	11.6
PRGL	23	19	12	14	16	11	7	6	15	13	13.6
FORB	1	1	5	3	0	0	1	1	2	0	1.4
ANN GRAS	1	0	2	5	0	0	1	2	2	0	1.3
EPHEDRA	0	0	1	2	2	2	1	1	1	1	1.1
ISTE	5	2	4	5	10	3	8	3	4	13	5.7
YUEL	1	0	1	1	1	0	1	0	0	2	0.7
TAAU	1	1	0	0	0	0	1	0	1	3	0.7
MUPO CAN	2	0	0	0	0	2	0	1	1	1	0.7
ARIS CAN	0	0	0	0	0	0	0	1	0	0	0.1
SEMA CAN	1	0	0	0	1	0	0	0	0	1	0.3

PLOT	ER1										
DATE	27-Sep-99										
	1	2	3	4	5	6	7	8	9	10	mean
SOIL	49	60	51	67	64	46	41	42	70	54	54.4
ROCK	2	3	0	2	0	1	3	0	2	0	1.3
BARE	51	63	51	69	64	47	44	42	72	54	55.7
LITTER	5	10	8	3	6	9	8	14	5	7	7.5
PRGL	10	8	6	4	4	7	8	10	3	10	7.0
FORB	18	10	18	10	14	21	19	19	13	16	15.8
ANN GRAS	6	0	3	3	2	4	5	4	2	3	3.2
EPHEDRA	1	1	0	0	0	0	0	0	0	0	0.2
ISTE	7	8	8	9	6	8	6	5	3	6	6.6
YUEL	1	1	0	0	0	0	0	0	0	0	0.2
TAAU	2	0	0	2	0	3	1	0	0	1	0.9
MUPO CAN	1	0	0	0	0	0	0	0	0	0	0.1
ARIS CAN	0	0	0	0	0	0	0	0	0	0	0.0
SEMA CAN	4	5	8	2	3	4	10	7	4	4	5.1

PLOT ER1	1996	1999
SOIL		54.4
ROCK		1.3
BARE	63.1	55.7
LITTER	11.6	7.5
PRGL	13.6	7
ISTE	5.7	6.6
ANN FORB	1.4	15.8
ANN GRAS	1.3	3.2
EPHEDRA	1.1	0.2
YUEL	0.7	0.2
TAAU	0.7	0.9
MUPO CAN	0.7	0.1
SEMA CAN	0.3	5.1
ARIS CAN	0.1	0

S.E.
2.3
1.6
1.6
0.5
0.5
0.2
1.1
0.2
0.3
0.3
0.1
0.2

S.E.
3.3
0.4
3.4
1.0
0.8
1.2
0.5
0.1
0.6
0.1
0.3
0.1
0.0
0.8

PLOT ER2
DATE 9/26/96

	1	2	3	4	5	6	7	8	9	10	mean
BARE	47	56	42	53	58	43	46	58	49	50	50.2
PRGL	17	27	29	23	15	27	22	17	20	21	21.8
LITTER	13	8	19	13	9	8	17	16	19	17	13.9
ISTE	9	9	11	10	10	8	11	7	10	10	9.5
ANN FORB	14	2	1	0	3	3	0	0	1	3	2.7
ANN GRAS	1	2	0	0	0	10	3	2	0	2	2.0
MUPO CAN	0	1	0	3	1	6	0	4	0	2	1.7
EPHEDRA	0	1	0	1	2	0	3	0	2	0	0.9
GUSA	1	0	0	0	2	0	0	1	0	0	0.4
SOEL	0	0	0	0	0	2	0	0	0	0	0.2
ERLE CAN	0	2	0	0	0	0	0	0	0	0	0.2
SEMA CAN	0	1	0	0	0	0	1	0	0	0	0.2
ARIS CAN	0	0	0	0	1	0	0	0	0	0	0.1
ACOU	1	0	0	0	0	0	0	0	0	0	0.1
MIBI	0	0	0	0	0	0	0	0	0	1	0.1
YUEL	0	0	0	0	0	0	0	0	1	0	0.1
DICA CAN	0	0	0	0	0	1	0	0	0	0	0.1

PLOT ER2
DATE 27-Sep-99

	1	2	3	4	5	6	7	8	mean
SOIL	51	60	39	38	42	38	48	35	43.9
ROCK	2	3	2	3	2	1	1	4	2.3
BARE	53	63	41	41	44	39	49	39	46.1
PRGL	14	9	19	26	26	25	27	24	21.3
LITTER	8	7	18	5	5	5	3	12	7.9
ISTE	16	18	11	25	15	26	13	14	17.3
ANN FORB	4	5	7	3	10	5	8	4	5.8
ANN GRAS	1	0	2	0	0	1	1	0	0.6
MUPO CAN	4	2	2	1	2	1	2	2	2.0
EPHEDRA	2	0	1	0	1	2	0	1	0.9
GUSA	0	0	2	0	2	0	3	0	0.9
SOEL	0	0	0	0	0	0	0	0	0.0
ERLE CAN	0	0	0	0	0	0	0	0	0.0
SEMA CAN	3	0	1	0	1	1	2	1	1.1
ARIS CAN	0	0	0	0	0	0	0	0	0.0
ACOU	1	2	1	0	0	0	0	0	0.5
MIBI	1	0	0	0	0	0	0	0	0.1
YUEL	0	0	0	0	0	0	0	0	0.0
DICA CAN	0	0	0	0	0	0	0	0	0.0

PLOT ER2	1996	1999
SOIL		43.9
ROCK		2.3
BARE	50.2	46.1
PRGL	21.8	21.3
LITTER	13.9	7.9
ISTE	9.5	17.3
ANN FORB	2.7	5.8
ANN GRAS	2.0	0.6
MUPO CAN	1.7	2.0
EPHEDRA	0.9	0.9
GUSA	0.4	0.9
SOEL	0.2	0.0
ERLE CAN	0.2	0.0
SEMA CAN	0.2	1.1
ARIS CAN	0.1	0.0
ACOU	0.1	0.5
MIBI	0.1	0.1
YUEL	0.1	0.0
DICA CAN	0.1	0.0

S.E.
1.9
1.5
1.4
0.4
1.3
1.0
0.7
0.3
0.2
0.2
0.2
0.1
0.1
0.1
0.1
0.1
0.1

S.E.
3.0
0.4
3.0
2.3
1.7
1.9
0.8
0.3
0.3
0.3
0.4
0.0
0.0
0.4
0.0
0.3
0.1
0.0
0.0

PLOT ER3
DATE 9/26/96

	1	2	3	4	5	6	7	8	9	10	mean
BARE	46	15	30	13	27	36	9	11	8	19	21.4
ANN GRAS	11	38	28	50	43	27	43	48	53	44	38.5
FORB	6	27	22	30	20	13	36	31	18	22	22.5
LITTER	12	8	6	5	3	15	7	8	11	5	8.0
ISTE	7	6	6	10	12	5	6	9	7	5	7.3
PRGL	7	7	8	7	2	7	8	8	2	3	5.9
MUPO CAN	5	4	1	5	1	4	5	1	10	6	4.2
SPCO CAN	3	1	2	3	1	2	1	0	1	1	1.5
EPHEDRA	2	2	2	2	0	1	1	0	1	1	1.2
SEMA CAN	1	1	0	0	0	1	4	0	0	1	0.8
DICA BAS	0	0	0	0	0	0	0	4	0	1	0.5
DICA CAN	0	1	0	0	0	0	0	0	0	2	0.3
SPCO BAS	0	0	0	0	0	1	1	0	0	1	0.3
MUPO BAS	0	0	0	1	0	1	1	0	0	0	0.3
GUSA	0	0	1	0	0	0	1	0	0	0	0.2
ERLE CAN	0	0	0	2	0	0	0	0	0	0	0.2
SEMA BAS	1	0	0	0	0	0	1	0	0	0	0.2
ZIGR	1	0	0	0	0	0	0	0	0	0	0.1
BOER CAN	0	0	1	0	0	0	0	0	0	0	0.1
4WING	0	0	1	0	0	0	0	0	0	0	0.1
ARIS CAN	1	0	0	0	0	0	0	0	0	0	0.1
SPFL CAN	0	1	0	0	0	0	0	0	0	0	0.1

PLOT ER3
DATE 27-Sep-99

	1	2	3	4	5	6	7	8	9	10	mean
SOIL	29	27	26	21	31	24	35	17	33	28	27.1
ROCK	4	3	5	1	2	1	0	0	1	3	2.0
BARE	33	30	31	22	33	25	35	17	34	31	29.1
ANN GRAS	14	31	26	36	19	17	30	34	26	25	25.8
FORB	27	33	43	40	37	36	27	33	33	35	34.4
LITTER	6	1	2	0	1	12	4	12	6	12	5.6
ISTE	7	6	2	0	4	7	3	4	1	3	3.7
PRGL	14	3	0	7	0	4	1	3	7	0	3.9
MUPO CAN	2	1	0	1	2	3	1	0	0	1	1.1
SPCO CAN	2	1	0	0	0	0	0	0	0	0	0.3
EPHEDRA	0	0	0	1	1	0	2	2	0	0	0.6
SEMA CAN	4	0	1	3	3	1	1	1	4	0	1.8
DICA BAS	0	0	0	0	0	0	0	0	0	0	0.0
DICA CAN	0	0	0	0	0	0	0	0	0	0	0.0
SPCO BAS	1	0	0	0	0	0	0	0	0	0	0.1
MUPO BAS	1	1	0	0	0	0	0	0	0	0	0.2
GUSA	0	2	0	0	0	0	1	2	0	0	0.5
ERLE CAN	0	0	0	2	2	0	0	0	0	0	0.4
SEMA BAS	1	0	0	0	2	0	1	0	0	0	0.4
ZIGR	0	0	0	0	0	0	0	0	0	0	0.0
BOER CAN	0	0	0	0	0	0	0	0	0	0	0.0
4WING	0	0	0	0	0	0	2	0	0	0	0.2
ARIS CAN	0	0	0	0	0	0	0	0	0	0	0.0
SPFL CAN	0	0	0	0	0	0	0	0	0	0	0.0

PLOT ER3	1996	1999

SOIL		27.1
ROCK		2.0
BARE	21.4	29.1
ANN GRAS	38.5	25.8
FORB	22.5	34.4
LITTER	8	5.6
ISTE	7.3	3.7
PRGL	5.9	3.9
MUPO CAN	4.2	1.1
SPCO CAN	1.5	0.3
EPHEDRA	1.2	0.6
SEMA CAN	0.8	1.8
DICA BAS	0.5	0
DICA CAN	0.3	0
SPCO BAS	0.3	0.1
MUPO BAS	0.3	0.2
GUSA	0.2	0.5
ERLE CAN	0.2	0.4
SEMA BAS	0.2	0.4
ZIGR	0.1	0
BOER CAN	0.1	0
4WING	0.1	0.2
ARIS CAN	0.1	0
SPFL CAN	0.1	0

S.E.
4.1
4.1
2.8
1.2
0.7
0.8
0.9
0.3
0.2
0.4
0.4
0.2
0.2
0.2
0.1
0.2
0.1
0.1
0.1
0.1
0.1
0.1

S.E.
1.7
0.5
1.9
2.3
1.6
1.5
0.8
1.4
0.3
0.2
0.3
0.5
0.0
0.0
0.1
0.1
0.3
0.3
0.2
0.0
0.0
0.2
0.0
0.0

PLOT ER4
DATE 9/26/96

	1	2	3	4	5	6	7	8	9	10	mean	S.E.
BARE	33	45	30	29	36	35	50	39	34	38	36.9	2.1
LITTER	26	8	17	4	14	4	7	6	9	7	10.2	2.2
PRGL	12	9	10	3	3	12	9	11	18	6	9.3	1.4
ANN FORB	13	15	20	22	12	9	6	15	8	17	13.7	1.6
ANN GRAS	18	15	7	29	23	23	8	11	11	20	16.5	2.3
ISTE	2	7	9	11	8	11	11	16	17	10	10.2	1.4
SPCO CAN	1	1	0	1	0	0	1	3	3	0	1.0	0.4
EPHEDRA	0	2	0	1	0	1	1	0	1	0	0.6	0.2
SEMA BAS	1	0	0	0	0	0	0	0	0	0	0.1	0.1
SEMA CAN	3	1	0	3	0	0	1	2	3	0	1.3	0.4
MUPO CAN	3	1	2	1	3	7	2	2	2	0	2.3	0.6
DICA CAN	1	0	0	0	1	0	0	0	1	0	0.3	0.2
ARIS BAS	0	0	0	0	1	0	1	1	0	0	0.3	0.2
ARIS CAN	1	0	1	0	4	0	2	2	1	0	1.1	0.4
ERLE CAN	0	1	1	0	0	1	0	0	0	0	0.3	0.2
CABA	0	1	0	0	0	0	0	0	0	0	0.1	0.1
SPFL CAN	0	0	1	0	0	0	1	1	0	0	0.3	0.2
YUEL	0	0	1	0	0	0	0	0	0	1	0.2	0.1
CRCO	0	0	2	0	1	0	0	0	0	3	0.6	0.3
TAAU	0	0	2	1	1	0	0	0	0	0	0.4	0.2
GUSA	0	0	0	0	0	0	0	1	0	0	0.1	0.1
DAPU CAN	0	0	0	0	1	0	0	0	0	0	0.1	0.1
ACOU	0	0	0	0	0	0	0	0	1	0	0.1	0.1
SOEL	0	0	0	0	0	0	0	0	1	0	0.1	0.1
OPLEP	0	0	0	0	0	0	0	1	0	0	0.1	0.1

PLOT ER4
DATE 28-Sep-99

	1	2	3	4	5	6	7	8	9	10	mean	S.E.
SOIL	30	40	40	44	34	38	39	38	46	39	38.8	1.4
ROCK	2	6	2	1	0	9	3	0	0	3	2.6	0.9
BARE	32	46	42	45	34	47	42	38	46	42	41.4	1.6
LITTER	6	6	4	4	5	10	7	11	4	12	6.9	1.0
PRGL	3	1	3	4	5	7	4	4	2	2	3.5	0.5
ANN FORB	32	32	37	28	38	29	33	37	30	33	32.9	1.1
ANN GRAS	22	7	8	7	12	12	8	5	10	5	9.6	1.6
ISTE	4	2	4	11	10	2	9	7	10	6	6.5	1.1
SPCO CAN	1	0	0	0	0	0	0	0	0	0	0.1	0.1
EPHEDRA	1	1	0	0	0	0	0	0	0	0	0.2	0.1
SEMA BAS	1	0	1	0	0	0	0	0	0	0	0.2	0.1
SEMA CAN	6	2	2	0	3	0	1	1	1	0	1.6	0.6
MUPO CAN	1	0	2	0	0	0	1	0	0	0	0.4	0.2
DICA CAN	0	1	1	0	0	0	0	0	0	0	0.2	0.1
ARIS BAS	0	0	0	0	0	0	0	0	0	0	0.0	0.0
ARIS CAN	1	0	0	0	0	0	0	0	0	0	0.1	0.1
ERLE CAN	3	4	1	2	1	0	5	0	0	0	1.6	0.6
CABA	0	0	0	0	0	0	0	0	0	0	0.0	0.0
SPFL CAN	0	0	0	0	0	0	0	0	0	0	0.0	0.0
YUEL	0	0	0	0	0	0	0	0	0	0	0.0	0.0
CRCO	0	0	0	0	0	0	0	0	0	0	0.0	0.0
TAAU	1	1	0	0	0	0	0	0	0	0	0.2	0.1
GUSA	1	1	2	1	0	0	0	0	0	0	0.5	0.2
DAPU CAN	1	0	0	0	0	0	0	0	0	0	0.1	0.1
ACOU	1	0	0	0	0	0	0	0	0	0	0.1	0.1
SOEL	0	0	0	0	0	0	0	0	0	0	0.0	0.0
OPLEP	0	0	0	0	0	0	0	0	0	0	0.0	0.0

PLOT ER4	1996	1999
SOIL		38.8
ROCK		2.6
BARE	36.9	41.4
LITTER	10.2	6.9
ANN GRAS	16.5	9.6
ANN FORB	13.7	32.9
ISTE	10.2	6.5
PRGL	9.3	3.5
MUPO CAN	2.3	0.4
SEMA CAN	1.3	1.6
ARIS CAN	1.1	0.1
SPCO CAN	1	0.1
EPHEDRA	0.6	0.2
CRCO	0.6	0
TAAU	0.4	0.2
DICA CAN	0.3	0.2
ARIS BAS	0.3	0
ERLE CAN	0.3	1.6
SPFL CAN	0.3	0
YUEL	0.2	0
SEMA BAS	0.1	0.2
CABA	0.1	0
GUSA	0.1	0.5
DAPU CAN	0.1	0.1
ACOU	0.1	0.1
SOEL	0.1	0
OPLEP	0.1	0

PLOT ER5
DATE SEPT 30, 1996

	1	2	3	4	5	6	7	8	9	10	mean	S.E.
BARE	36	41	41	35	38	33	27	26	29	36	34.2	1.7
LITTER	7	9	11	7	10	15	17	5	4	1	8.6	1.6
FORB	17	15	10	9	12	15	18	15	18	12	14.1	1.0
PRGL	8	11	13	10	14	8	7	18	14	23	12.6	1.6
ANN GRAS	22	25	18	23	21	22	27	28	32	24	24.2	1.3
SPCO BAS	0	0	0	0	0	0	0	1	0	0	0.1	0.1
SPCO CAN	2	0	0	0	0	0	0	2	0	1	0.5	0.3
ISTE	6	0	1	3	5	0	0	3	1	1	2.0	0.7
ARIS BAS	1	0	0	0	0	1	0	0	0	1	0.3	0.2
ARIS CAN	5	1	3	4	3	6	6	1	0	1	3.0	0.7
EPHEDRA	1	0	2	1	1	1	0	1	0	1	0.8	0.2
TAAU	1	0	0	0	3	2	0	1	0	1	0.8	0.3
SEMA BAS	0	0	0	1	0	0	0	1	0	0	0.2	0.1
SEMA CAN	1	3	1	1	0	2	0	2	2	0	1.2	0.3
CRCO	1	0	0	0	0	0	0	0	0	0	0.1	0.1
GUSA	0	2	5	3	0	0	3	2	1	1	1.7	0.5
MUPO BAS	0	0	0	0	1	0	0	1	0	1	0.3	0.2
MUPO CAN	0	1	4	1	2	1	3	3	3	4	2.2	0.4
YUEL	0	0	1	1	1	0	0	1	0	0	0.4	0.2
ERLE BAS	0	0	0	0	0	1	0	1	0	0	0.2	0.1
ERLE CAN	0	0	0	2	0	1	0	3	0	0	0.6	0.3
SPSP	0	0	0	1	0	0	0	0	0	0	0.1	0.1
DICA BAS	0	0	0	0	0	0	0	0	0	0	0.0	0.0
DICA CAN	0	0	0	1	0	0	1	0	1	0	0.3	0.2
ACOU	0	0	0	0	2	0	0	0	1	0	0.3	0.2

PLOT ER5
DATE 28-Sep-99

	1	2	3	4	5	6	7	8	9	10	mean	S.E.
SOIL	52	32	39	34	39	45	33	41	33	36	38.4	2.0
ROCK	0	4	1	4	0	5	2	1	8	1	2.6	0.8
BARE	52	36	40	38	39	50	35	42	41	37	41.0	1.8
LITTER	6	5	4	5	4	2	3	4	2	4	3.9	0.4
FORB	28	33	33	26	37	27	44	35	27	39	32.9	1.9
PRGL	2	4	6	2	5	3	5	9	20	3	5.9	1.7
ANN GRAS	8	23	8	17	10	14	12	7	9	8	11.6	1.6
SPCO BAS	0	0	0	0	0	0	0	0	0	0	0.0	0.0
SPCO CAN	1	0	0	0	0	0	0	0	0	0	0.1	0.1
ISTE	4	1	1	1	0	0	2	1	1	1	1.2	0.4
ARIS BAS	1	0	1	0	0	0	0	0	0	0	0.2	0.1
ARIS CAN	0	0	2	1	0	0	0	0	0	0	0.3	0.2
EPHEDRA	1	2	0	0	0	0	0	0	0	0	0.3	0.2
TAAU	2	1	0	0	0	0	0	0	0	0	0.3	0.2
SEMA BAS	0	0	0	0	0	0	0	0	1	0	0.1	0.1
SEMA CAN	0	0	1	0	0	0	0	0	6	0	0.7	0.6
CRCO	1	0	0	0	0	0	0	0	0	0	0.1	0.1
GUSA	0	3	4	8	5	2	3	3	5	0	3.3	0.8
MUPO BAS	0	0	0	0	0	0	0	0	1	0	0.1	0.1
MUPO CAN	0	0	4	0	0	0	0	0	3	0	0.7	0.5
YUEL	1	0	1	0	0	1	0	0	0	0	0.3	0.2
ERLE BAS	0	0	0	0	0	0	0	0	0	2	0.2	0.2
ERLE CAN	2	1	3	3	3	4	2	3	2	12	3.5	1.0
SPSP	0	0	0	0	0	0	0	0	0	0	0.0	0.0
DICA BAS	0	0	0	0	0	0	0	0	0	0	0.0	0.0
DICA CAN	0	0	0	0	0	0	0	0	0	0	0.0	0.0
ACOU	0	0	0	0	1	2	0	4	0	0	0.7	0.4

PLOT ER5	1996	1999
SOIL		38.4
ROCK		2.6
BARE	34.2	41.0
LITTER	8.6	3.9
ANN GRAS	24.2	11.6
ANN FORB	14.1	32.9
PRGL	12.6	5.9
ARIS CAN	3.0	0.3
MUPO CAN	2.2	0.7
ISTE	2.0	1.2
GUSA	1.7	3.3
SEMA CAN	1.2	0.7
EPHEDRA	0.8	0.3
TAAU	0.8	0.3
ERLE CAN	0.6	3.5
SPCO CAN	0.5	0.1
YUEL	0.4	0.3
ARIS BAS	0.3	0.2
MUPO BAS	0.3	0.1
DICA CAN	0.3	0.0
ACOU	0.3	0.7
SEMA BAS	0.2	0.1
ERLE BAS	0.2	0.2
SPCO BAS	0.1	0.0
CRCO	0.1	0.1
SPSP	0.1	0.0
DICA BAS	0	0.0

PLOT ER6
DATE SEPT 30, 1996

	1	2	3	4	5	6	7	8	9	10	mean
BARE	14	26	31	52	35	33	14	15	27	26	27.3
LITTER	9	9	5	6	7	16	7	8	8	12	8.7
ANN FORB	40	29	19	11	6	18	17	25	8	18	19.1
PRGL	2	6	5	8	8	5	5	3	12	17	7.1
ANN GRAS	32	21	30	12	13	8	52	41	7	10	22.6
ARIS BAS	0	0	0	0	0	0	2	0	2	0	0.4
ARIS CAN	8	5	8	3	3	4	6	0	3	2	4.2
EPHEDRA	1	1	0	1	1	2	0	2	1	1	1.0
MUPO BAS	0	0	0	0	0	0	0	0	0	0	0.0
MUPO CAN	2	2	0	2	2	2	0	1	1	0	1.2
SEMA BAS	0	0	0	0	0	2	1	0	1	0	0.4
SEMA CAN	1	0	1	1	0	3	2	0	3	1	1.2
ISTE	10	7	4	5	8	8	6	7	7	6	6.8
GUSA	3	1	0	0	0	0	2	0	0	0	0.6
SPCO BAS	0	0	0	0	0	0	0	0	0	0	0.0
SPCO CAN	1	0	0	0	1	1	1	0	0	0	0.4
CRCO	1	0	0	0	0	1	0	0	0	3	0.5
ERLE BAS	0	1	0	1	2	0	0	0	2	1	0.7
ERLE CAN	0	3	0	5	16	8	1	3	20	9	6.5
YUEL	0	1	2	0	1	2	1	0	2	2	1.1
CABA	0	0	0	0	0	0	0	0	0	1	0.1
DICA BAS	0	0	0	0	0	0	0	0	0	0	0.0
DICA CAN	0	0	1	0	0	0	0	0	0	0	0.1

PLOT ER6
DATE 29-Sep-99

	1	2	3	4	5	6	7	8	mean
SOIL	43	47	40	37	42	43	39	43	41.8
ROCK	0	0	3	2	0	1	4	4	1.8
BARE	43	47	43	39	42	44	43	47	43.5
LITTER	7	5	8	8	5	4	3	6	5.8
ANN FORB	24	16	18	14	23	23	17	16	18.9
PRGL	3	3	4	5	2	3	7	10	4.6
ANN GRAS	5	7	8	5	11	2	7	0	5.6
ARIS BAS	1	1	0	0	0	2	0	1	0.6
ARIS CAN	5	2	0	2	1	3	4	1	2.3
EPHEDRA	0	1	0	1	2	1	0	0	0.6
MUPO BAS	0	0	0	0	0	0	0	0	0.0
MUPO CAN	2	3	0	2	7	9	1	1	3.1
SEMA BAS	0	0	0	0	0	1	1	0	0.3
SEMA CAN	0	0	1	0	2	1	4	2	1.3
ISTE	9	13	13	10	14	14	12	12	12.1
GUSA	2	1	3	1	1	1	0	3	1.5
SPCO BAS	0	0	0	0	0	0	0	0	0.0
SPCO CAN	1	0	0	0	0	0	0	0	0.1
CRCO	1	0	0	0	0	0	0	0	0.1
ERLE BAS	0	0	0	1	0	0	0	0	0.1
ERLE CAN	1	5	2	14	4	1	18	7	6.5
YUEL	1	0	1	0	0	0	2	0	0.5
CABA	0	0	0	0	0	0	0	0	0.0
DICA BAS	0	0	0	0	0	0	0	0	0.0
DICA CAN	1	0	0	0	0	0	0	0	0.1

PLOT ER6	1996	1999
SOIL		41.8
ROCK		1.8
BARE	27.3	43.5
LITTER	8.7	5.8
ANN GRAS	22.6	5.6
ANN FORB	19.1	18.9
PRGL	7.1	4.6
ISTE	6.8	12.1
ERLE CAN	6.5	6.5
ARIS CAN	4.2	2.3
MUPO CAN	1.2	3.1
SEMA CAN	1.2	1.3
YUEL	1.1	0.5
EPHEDRA	1.0	0.6
ERLE BAS	0.7	0.1
GUSA	0.6	1.5
CRCO	0.5	0.1
ARIS BAS	0.4	0.6
SEMA BAS	0.4	0.3
SPCO CAN	0.4	0.1
CABA	0.1	0.0
DICA CAN	0.1	0.1
MUPO BAS	0.0	0.0
SPCO BAS	0.0	0.0
DICA BAS	0.0	0.0

S.E.
3.7
1.0
3.2
1.4
4.9
0.3
0.8
0.2
0.0
0.3
0.2
0.4
0.5
0.3
0.0
0.2
0.3
0.3
2.2
0.3
0.1
0.0
0.1

S.E.
1.1
0.6
0.9
0.6
1.4
0.9
1.2
0.3
0.6
0.3
0.0
1.1
0.2
0.5
0.6
0.4
0.0
0.1
0.1
0.1
2.2
0.3
0.0
0.0
0.1

PLOT ER7
DATE OCT 1, 1996

	1	2	3	4	5	6	7	8	9	10	mean	S.E.
BARE	63	55	57	45	52	55	69	56	53	62	56.7	2.1
LITTER	13	20	19	14	13	18	17	8	14	7	14.3	1.4
FORB	3	2	4	13	10	7	0	1	7	8	5.5	1.3
PRGL	9	13	12	3	16	10	4	26	5	6	10.4	2.2
ANN GRAS	2	0	0	6	0	2	1	0	4	5	2.0	0.7
ISTE	8	9	7	7	5	7	8	8	13	9	8.1	0.7
TAAU	1	1	0	2	0	1	0	0	0	0	0.5	0.2
DAPU BAS	1	0	0	0	0	0	0	0	0	0	0.1	0.1
DAPU CAN	1	0	0	0	0	0	0	0	0	0	0.1	0.1
EPHEDRA	0	0	1	0	0	1	0	0	1	1	0.4	0.2
ERLE BAS	0	0	0	0	0	0	0	0	0	0	0.0	0.0
ERLE CAN	0	0	0	1	4	0	1	2	4	0	1.2	0.5
GUSA	0	0	0	1	0	0	0	0	1	1	0.3	0.2
ARIS BAS	0	0	0	0	0	0	0	0	0	0	0.0	0.0
ARIS CAN	1	0	0	3	1	0	0	0	1	0	0.6	0.3
SEMA BAS	0	0	0	0	0	0	0	0	0	0	0.0	0.0
SEMA CAN	0	0	0	0	1	0	0	0	0	0	0.1	0.1

PLOT ER7
DATE 27-Sep-99

	1	2	3	4	5	6	7	8	9	10	mean	S.E.
SOIL	44	54	46	52	31	57	49	59	41	51	48.4	2.6
ROCK	1	7	1	0	2	2	1	1	4	2	2.1	0.6
BARE	45	61	47	52	33	59	50	60	45	53	50.5	2.7
LITTER	5	7	11	5	4	8	12	4	8	3	6.7	1.0
ANN FORB	34	15	21	23	39	13	24	22	22	17	23.0	2.5
PRGL	10	2	9	4	16	9	3	7	7	4	7.1	1.3
ANN GRAS	4	3	3	3	10	1	2	4	12	19	6.1	1.8
ISTE	5	8	7	11	4	9	7	4	8	6	6.9	0.7
TAAU	1	1	1	0	0	0	0	0	0	0	0.3	0.2
DAPU BAS	0	0	0	0	0	0	0	0	0	0	0.0	0.0
DAPU CAN	0	0	0	0	0	0	0	0	0	0	0.0	0.0
EPHEDRA	1	0	0	0	0	0	0	0	0	0	0.1	0.1
ERLE BAS	0	0	0	0	0	0	0	0	0	0	0.0	0.0
ERLE CAN	0	0	0	3	13	0	0	0	0	0	1.6	1.3
GUSA	0	1	0	1	1	0	0	0	0	1	0.4	0.2
ARIS BAS	0	0	0	0	0	0	0	0	0	0	0.0	0.0
ARIS CAN	0	0	0	0	0	0	0	0	0	0	0.0	0.0
SEMA BAS	0	0	0	0	0	1	0	0	0	0	0.1	0.1
SEMA CAN	1	0	3	0	4	1	0	0	1	2	1.2	0.4

PLOT ER7	1996	1999
SOIL		48.4
ROCK		2.1
BARE	56.7	50.5
LITTER	14.3	6.7
PRGL	10.4	7.1
ISTE	8.1	6.9
ANN FORB	5.5	23.0
ANN GRAS	2.0	6.1
ERLE CAN	1.2	1.6
ARIS CAN	0.6	0.0
TAAU	0.5	0.3
EPHEDRA	0.4	0.1
GUSA	0.3	0.4
DAPU BAS	0.1	0.0
DAPU CAN	0.1	0.0
SEMA CAN	0.1	1.2
ERLE BAS	0.0	0.0
ARIS BAS	0.0	0.0
SEMA BAS	0.0	0.1

PLOT ER8
DATE OCT 1, 1996

	1	2	3	4	5	6	7	8	9	10	mean	S.E.
BARE	38	48	26	31	11	44	29	28	13	31	29.9	3.7
LITTER	12	12	13	11	8	7	14	18	14	10	11.9	1.0
ANN FORB	20	9	19	20	35	17	21	23	28	26	21.8	2.2
PRGL	9	23	9	7	6	10	16	6	9	5	10.0	1.7
ANN GRAS	16	3	19	22	39	10	16	21	32	18	19.6	3.2
ISTE	1	1	1	3	7	3	1	3	3	7	3.0	0.7
ACOU	2	0	0	0	0	0	0	0	0	0	0.2	0.2
ARIS BAS	0	0	0	0	1	0	0	0	0	1	0.2	0.1
ARIS CAN	3	4	5	1	7	3	1	1	5	3	3.3	0.6
GUSA	2	0	3	0	1	3	1	0	1	1	1.2	0.4
YUEL	0	0	0	1	0	0	0	1	1	0	0.3	0.2
SPCO BAS	2	0	2	0	0	0	1	0	1	0	0.6	0.3
SPCO CAN	4	1	8	0	2	2	7	0	2	1	2.7	0.9
MUPO BAS	0	0	0	0	0	0	0	1	0	0	0.1	0.1
MUPO CAN	3	5	1	1	1	2	3	1	4	2	2.3	0.4
DICA BAS	0	0	0	0	1	0	0	0	0	0	0.1	0.1
DICA CAN	1	0	0	0	1	0	0	0	0	0	0.2	0.1
SPFL BAS	0	0	0	0	0	0	0	0	0	0	0.0	0.0
SPFL CAN	0	0	2	0	0	0	0	0	0	0	0.2	0.2
EPHEDRA	0	0	0	0	4	2	0	0	4	1	1.1	0.5
SEMA BAS	0	0	0	0	0	0	0	0	0	0	0.0	0.0
SEMA CAN	0	0	0	0	1	0	0	2	1	0	0.4	0.2
CRCO	0	0	0	0	0	0	0	0	0	1	0.1	0.1
ERLE BAS	0	0	0	0	0	0	0	0	1	0	0.1	0.1
ERLE CAN	0	0	0	0	0	1	0	0	1	0	0.2	0.1

PLOT ER8
DATE 27-Sep-99

	1	2	3	4	5	6	7	8	mean	S.E.
SOIL	39	38	28	31	43	59	34	45	39.6	3.1
ROCK	3	2	5	6	2	1	3	1	2.9	0.6
BARE	42	40	33	37	45	60	37	46	42.5	2.6
LITTER	4	2	4	4	6	4	8	5	4.6	0.6
ANN FORB	17	30	25	27	18	14	29	16	22.0	2.0
PRGL	22	17	14	3	13	9	10	4	11.5	2.0
ANN GRAS	7	4	7	12	9	5	3	11	7.3	1.0
ISTE	2	0	5	10	1	5	4	10	4.6	1.2
ACOU	1	0	0	0	0	0	0	0	0.1	0.1
ARIS BAS	0	0	1	0	0	1	0	0	0.3	0.1
ARIS CAN	0	3	2	2	2	2	0	1	1.5	0.3
GUSA	6	11	10	5	5	5	7	4	6.6	0.8
YUEL	1	1	1	0	0	0	0	0	0.4	0.2
SPCO BAS	0	0	0	0	0	0	0	0	0.0	0.0
SPCO CAN	3	1	1	1	1	0	1	0	1.0	0.3
MUPO BAS	0	0	1	0	0	0	1	0	0.3	0.1
MUPO CAN	5	2	5	2	4	1	2	2	2.9	0.5
DICA BAS	0	0	0	0	0	0	0	0	0.0	0.0
DICA CAN	0	0	0	0	0	0	0	0	0.0	0.0
SPFL BAS	0	0	0	0	0	0	0	0	0.0	0.0
SPFL CAN	0	0	0	0	0	0	0	0	0.0	0.0
EPHEDRA	1	0	0	0	0	0	0	0	0.1	0.1
SEMA BAS	0	0	0	0	0	0	1	0	0.1	0.1
SEMA CAN	1	5	5	1	2	3	2	5	3.0	0.6
CRCO	0	0	0	0	0	0	0	0	0.0	0.0
ERLE BAS	0	0	0	0	0	0	0	0	0.0	0.0
ERLE CAN	3	0	0	0	0	0	0	0	0.4	0.3

PLOT ER8	1996	1999
SOIL		39.6
ROCK		2.9
BARE	29.9	42.5
LITTER	11.9	4.6
ANN FORB	21.8	22.0
ANN GRAS	19.6	7.3
PRGL	10.0	11.5
ARIS CAN	3.3	1.5
ISTE	3.0	4.6
SPCO CAN	2.7	1.0
MUPO CAN	2.3	2.9
GUSA	1.2	6.6
EPHEDRA	1.1	0.1
SPCO BAS	0.6	0.0
SEMA CAN	0.4	3.0
YUEL	0.3	0.4
ACOU	0.2	0.1
ARIS BAS	0.2	0.3
DICA CAN	0.2	0.0
SPFL CAN	0.2	0.0
ERLE CAN	0.2	0.4
MUPO BAS	0.1	0.3
DICA BAS	0.1	0.0
CRCO	0.1	0.0
ERLE BAS	0.1	0.0
SPFL BAS	0.0	0.0
SEMA BAS	0.0	0.1

PLOT ER9
DATE OCT 1, 1996

	1	2	3	4	5	6	7	8	9	10	mean	S.E.
BARE	27	15	18	13	10	27	16	10	11	25	17.2	2.2
LITTER	2	2	9	3	3	4	19	24	35	21	12.2	3.7
ANN FORB	26	41	24	35	31	35	19	24	35	21	29.1	2.3
PRGL	9	6	9	20	1	8	18	11	12	5	9.9	1.8
ANN GRAS	30	43	40	41	63	37	36	54	38	45	42.7	3.0
ISTE	4	2	4	4	3	1	5	4	2	6	3.5	0.5
GUSA	2	0	1	0	0	0	2	0	2	0	0.7	0.3
EPHEDRA	2	5	1	1	1	1	1	3	7	2	2.4	0.7
ARIS BAS	0	0	0	0	0	0	0	0	0	0	0.0	0.0
ARIS CAN	1	0	0	1	0	0	0	0	0	0	0.2	0.1
MUPO BAS	0	0	0	0	0	0	0	0	2	2	0.4	0.3
MUPO CAN	7	3	3	0	0	2	11	1	4	8	3.9	1.2
ERLE BAS	2	0	0	0	0	0	0	0	0	0	0.2	0.2
ERLE CAN	3	0	1	2	1	1	0	0	0	0	0.8	0.3
SPCO BAS	0	0	0	0	0	0	0	0	0	0	0.0	0.0
SPCO CAN	1	0	0	0	0	0	0	0	0	0	0.1	0.1
DICA BAS	1	0	0	0	0	1	0	0	0	0	0.2	0.1
DICA CAN	1	0	0	1	0	1	0	0	1	0	0.4	0.2
DAPU BAS	0	0	0	0	0	0	0	2	0	1	0.3	0.2
DAPU CAN	0	0	2	0	0	0	0	2	0	1	0.5	0.3
YUEL	0	0	0	3	1	0	0	0	1	2	0.7	0.3
BARREL	1	0	0	0	0	0	0	0	0	0	0.1	0.1
CHLI	0	0	0	1	0	1	0	0	2	0	0.4	0.2
SEMA BAS	0	0	0	0	0	0	0	0	0	0	0.0	0.0
SEMA CAN	0	0	0	0	1	0	0	1	0	1	0.3	0.2
TAAU	0	0	0	0	0	0	0	0	0	1	0.1	0.1

PLOT ER9
DATE 28-Sep-99

	1	2	3	4	5	6	7	8	9	10	mean	S.E.
SOIL	28	30	19	24	23	18	25	36	19	47	26.9	2.8
ROCK	6	11	7	5	11	10	4	10	8	12	8.4	0.9
BARE	34	41	26	29	34	28	29	46	27	59	35.3	3.3
LITTER	4	6	2	5	5	10	4	10	4	5	5.5	0.8
ANN FORB	36	33	37	36	32	37	38	27	45	22	34.3	2.0
PRGL	2	3	11	10	8	5	0	0	2	2	4.3	1.3
ANN GRAS	25	23	37	31	19	20	28	20	24	12	23.9	2.2
ISTE	3	0	3	1	1	1	2	2	2	2	1.7	0.3
GUSA	1	1	0	0	0	0	0	0	0	0	0.2	0.1
EPHEDRA	1	1	0	0	6	1	1	0	0	0	1.0	0.6
ARIS BAS	0	0	0	0	0	0	0	0	0	0	0.0	0.0
ARIS CAN	0	0	0	0	0	0	0	0	0	0	0.0	0.0
MUPO BAS	0	0	0	0	0	0	0	0	0	0	0.0	0.0
MUPO CAN	0	1	0	0	3	0	0	0	0	2	0.6	0.3
ERLE BAS	0	0	0	0	0	0	0	0	0	0	0.0	0.0
ERLE CAN	1	0	0	0	0	0	0	0	0	0	0.1	0.1
SPCO BAS	0	0	0	0	0	0	0	0	0	0	0.0	0.0
SPCO CAN	1	0	0	0	0	0	0	0	0	0	0.1	0.1
DICA BAS	0	0	0	0	0	0	0	0	0	0	0.0	0.0
DICA CAN	0	0	0	0	0	0	0	0	0	0	0.0	0.0
DAPU BAS	0	0	0	0	0	0	0	0	0	0	0.0	0.0
DAPU CAN	0	0	0	0	0	0	0	0	0	0	0.0	0.0
YUEL	1	1	0	0	0	0	0	0	0	0	0.2	0.1
BARREL	0	0	0	0	0	0	0	0	0	0	0.0	0.0
CHLI	0	2	0	0	0	0	0	0	0	0	0.2	0.2
SEMA BAS	0	0	1	0	0	0	0	0	0	0	0.1	0.1
SEMA CAN	3	3	5	2	0	3	0	0	0	0	1.6	0.6
TAAU	0	0	0	0	0	0	0	0	0	0	0.0	0.0

PLOT ER9	1996	1999
SOIL		26.9
ROCK		8.4
BARE	17.2	35.3
LITTER	12.2	5.5
ANN GRAS	42.7	23.9
ANN FORB	29.1	34.3
PRGL	9.9	4.3
MUPO CAN	3.9	0.6
ISTE	3.5	1.7
EPHEDRA	2.4	1.0
ERLE CAN	0.8	0.1
GUSA	0.7	0.2
YUEL	0.7	0.2
DAPU CAN	0.5	0.0
MUPO BAS	0.4	0.0
DICA CAN	0.4	0.0
CHLI	0.4	0.2
DAPU BAS	0.3	0.0
SEMA CAN	0.3	1.6
ARIS CAN	0.2	0.0
ERLE BAS	0.2	0.0
DICA BAS	0.2	0.0
SPCO CAN	0.1	0.1
BARREL	0.1	0.0
TAAU	0.1	0.0
ARIS BAS	0	0.0
SPCO BAS	0	0.0
SEMA BAS	0	0.1

PLOT ER10
DATE OCT 1, 1996

	1	2	3	4	5	6	7	8	9	10	mean
BARE	16	23	43	34	38	28	44	33	42	34	33.5
LITTER	6	7	6	8	7	3	8	7	2	6	6.0
ANN FORB	21	16	14	13	11	18	8	9	13	14	13.7
PRGL	0	1	12	5	2	1	2	6	7	4	4.0
ANN GRAS	52	52	13	22	45	48	30	38	30	33	36.3
MUPO BAS	1	0	0	0	0	0	0	0	0	0	0.1
MUPO CAN	6	2	2	3	0	0	5	6	2	2	2.8
DICA BAS	0	0	0	0	0	0	0	0	0	0	0.0
DICA CAN	1	0	0	0	0	0	0	0	0	0	0.1
ISTE	14	8	7	16	4	6	4	5	1	11	7.6
ERLE BAS	0	0	0	0	0	0	0	0	0	0	0.0
ERLE CAN	1	0	0	0	0	0	0	0	0	1	0.2
ARIS BAS	0	0	0	1	0	0	0	0	0	0	0.1
ARIS CAN	0	2	3	2	0	0	1	2	3	2	1.5
YUEL	0	1	0	1	0	0	2	0	0	1	0.5
SEMA BAS	0	0	0	0	0	0	0	0	0	0	0.0
SEMA CAN	0	0	2	0	2	0	0	1	1	0	0.6
EPHEDRA	0	0	1	0	0	0	0	2	0	0	0.3
GUSA	0	0	1	0	1	0	0	0	0	1	0.3
TARBUSH	0	0	1	0	0	0	0	0	0	0	0.1
CRCO	0	0	1	0	0	0	0	0	0	0	0.1
CODI	1	0	0	0	0	0	0	0	0	0	0.1

PLOT ER10
DATE 28-Sep-99

	1	2	3	4	5	6	7	8	9	10	mean
SOIL	39	38	39	35	42	45	48	52	44	39	42.1
ROCK	4	4	3	4	0	0	4	5	7	4	3.5
BARE	43	42	42	39	42	45	52	57	51	43	45.6
LITTER	13	10	5	11	4	4	5	5	5	5	6.7
ANN FORB	29	29	22	37	35	32	25	13	24	26	27.2
PRGL	0	2	3	2	3	2	5	1	4	1	2.3
ANN GRAS	12	15	17	13	14	8	12	14	12	24	14.1
MUPO BAS	0	0	0	0	1	0	2	0	0	0	0.3
MUPO CAN	0	0	0	0	2	0	3	0	0	0	0.5
DICA BAS	0	0	0	0	0	0	0	0	1	0	0.1
DICA CAN	1	0	0	0	0	0	0	0	1	0	0.2
ISTE	6	7	10	1	3	7	4	9	8	2	5.7
ERLE BAS	0	0	0	0	0	0	0	0	0	0	0.0
ERLE CAN	1	1	0	0	0	0	0	0	0	0	0.2
ARIS BAS	0	0	0	0	0	0	0	0	0	0	0.0
ARIS CAN	0	0	1	0	1	0	1	0	0	0	0.3
YUEL	0	0	0	0	0	1	0	1	2	2	0.6
SEMA BAS	0	0	0	0	0	0	0	0	0	0	0.0
SEMA CAN	1	2	1	0	0	2	1	0	0	0	0.7
EPHEDRA	1	0	0	0	0	0	0	0	0	0	0.1
GUSA	1	2	1	1	0	0	0	0	0	0	0.5
TARBUSH	0	0	0	0	0	0	0	0	0	0	0.0
CRCO	0	0	0	0	0	0	0	0	0	0	0.0
CODI	0	0	0	0	0	0	0	0	0	0	0.0

PLOT ER10	1996	1999

SOIL		42.1
ROCK		3.5
BARE	33.5	45.6
LITTER	6.0	6.7
ANN FORB	13.7	27.2
PRGL	4.0	2.3
ANN GRAS	36.3	14.1
MUPO BAS	0.1	0.3
MUPO CAN	2.8	0.5
DICA BAS	0.0	0.1
DICA CAN	0.1	0.2
ISTE	7.6	5.7
ERLE BAS	0.0	0.0
ERLE CAN	0.2	0.2
ARIS BAS	0.1	0.0
ARIS CAN	1.5	0.3
YUEL	0.5	0.6
SEMA BAS	0.0	0.0
SEMA CAN	0.6	0.7
EPHEDRA	0.3	0.1
GUSA	0.3	0.5
TARBUSH	0.1	0.0
CRCO	0.1	0.0
CODI	0.1	0.0

S.E.
2.9
0.6
1.2
1.2
4.1
0.1
0.7
0.0
0.1
1.5
0.0
0.1
0.1
0.4
0.2
0.0
0.3
0.2
0.2
0.1
0.1
0.1

S.E.
1.6
0.7
1.8
1.0
2.2
0.5
1.3
0.2
0.3
0.1
0.1
1.0
0.0
0.1
0.0
0.2
0.3
0.0
0.3
0.1
0.2
0.0
0.0
0.0

PLOT ER11
DATE OCT 2, 1996

	1	2	3	4	5	6	7	8	9	10	mean	S.E.
BARE	27	46	16	31	30	32	27	22	30	32	29.3	2.4
LITTER	13	12	13	11	10	11	6	10	7	12	10.5	0.7
ANN FORB	20	9	12	19	24	8	15	16	17	20	16.0	1.6
PRGL	0	3	1	1	5	9	1	4	1	1	2.6	0.9
ANN GRAS	30	18	38	19	13	28	30	33	27	17	25.3	2.6
YUEL	0	0	0	3	0	1	1	0	1	0	0.6	0.3
ISTE	3	3	9	8	14	10	15	10	6	7	8.5	1.3
ARIS BAS	2	0	0	0	0	0	0	0	0	0	0.2	0.2
ARIS CAN	8	4	3	2	5	6	2	5	5	6	4.6	0.6
TAAU	1	0	0	0	0	0	0	1	0	0	0.2	0.1
EPHEDRA	1	1	2	0	0	0	1	1	3	0	0.9	0.3
BOBA BAS	0	0	0	0	0	0	0	0	0	0	0.0	0.0
BOBA CAN	1	0	0	0	0	0	0	0	0	0	0.1	0.1
GUSA	3	4	4	2	1	2	0	2	0	0	1.8	0.5
DICA BAS	0	0	1	0	0	0	0	0	0	0	0.1	0.1
DICA CAN	1	0	1	0	0	0	0	0	0	0	0.2	0.1
SEMA BAS	0	1	0	0	0	0	0	0	0	0	0.1	0.1
SEMA CAN	0	2	0	0	0	0	0	0	0	0	0.2	0.2
MUPO BAS	0	1	0	2	0	0	0	0	0	1	0.4	0.2
MUPO CAN	0	1	2	6	5	1	3	1	1	2	2.2	0.6
ERIN BAS	0	0	0	0	0	0	0	0	0	0	0.0	0.0
ERIN CAN	0	1	0	0	0	0	0	0	0	0	0.1	0.1
ERLE BAS	0	0	0	0	0	0	0	0	0	0	0.0	0.0
ERLE CAN	0	1	3	2	2	0	2	3	5	5	2.3	0.6
SPCO BAS	0	0	0	0	0	0	0	0	2	0	0.2	0.2
SPCO CAN	0	0	2	0	2	0	1	4	4	3	1.6	0.5
SPFL BAS	0	0	0	2	0	0	0	0	0	0	0.2	0.2
SPFL CAN	0	0	1	2	0	0	0	1	0	0	0.4	0.2

PLOT ER11
DATE 29-Sep-99

	1	2	3	4	5	6	7	8	9	10	mean	S.E.
SOIL	35	35	33	41	39	40	37	32	43	41	37.6	1.2
ROCK	3	5	4	2	2	3	2	5	3	2	3.1	0.4
BARE	38	40	37	43	41	43	39	37	46	43	40.7	1.0
LITTER	12	9	12	8	7	7	6	12	6	4	8.3	0.9
ANN FORB	34	22	27	22	38	29	30	23	26	27	27.8	1.6
PRGL	5	7	0	1	0	0	0	1	0	2	1.6	0.8
ANN GRAS	10	8	10	7	3	17	15	11	8	1	9.0	1.5
YUEL	0	0	0	0	0	0	0	0	0	0	0.0	0.0
ISTE	2	5	7	6	7	2	6	3	3	6	4.7	0.6
ARIS BAS	0	0	1	1	0	0	0	0	0	0	0.2	0.1
ARIS CAN	0	2	4	2	1	0	1	0	0	2	1.2	0.4
TAAU	0	0	0	0	0	0	0	0	0	0	0.0	0.0
EPHEDRA	1	1	1	0	0	0	0	0	0	0	0.3	0.2
BOBA BAS	0	0	0	0	0	0	0	0	0	0	0.0	0.0
BOBA CAN	0	0	0	0	0	0	0	0	0	0	0.0	0.0
GUSA	0	0	1	5	0	0	1	3	2	1	1.3	0.5
DICA BAS	0	0	0	0	0	0	0	0	0	0	0.0	0.0
DICA CAN	0	0	0	0	0	0	0	0	0	0	0.0	0.0
SEMA BAS	0	0	0	0	0	1	0	0	0	0	0.1	0.1
SEMA CAN	1	0	0	0	0	1	0	0	0	0	0.2	0.1
MUPO BAS	0	0	1	3	0	0	0	1	1	4	1.0	0.4
MUPO CAN	0	0	0	0	0	0	0	0	0	0	0.0	0.0
ERIN BAS	0	0	0	0	0	0	0	0	0	0	0.0	0.0
ERIN CAN	0	0	0	0	0	0	0	0	0	0	0.0	0.0
ERLE BAS	0	0	0	0	0	0	1	0	2	2	0.5	0.3
ERLE CAN	3	7	2	5	4	2	8	4	11	11	5.7	1.1
SPCO BAS	0	0	0	0	0	0	0	0	0	2	0.2	0.2
SPCO CAN	0	0	0	0	1	0	0	0	0	2	0.3	0.2
SPFL BAS	0	0	0	0	0	0	0	0	0	0	0.0	0.0
SPFL CAN	0	0	0	0	0	0	0	0	0	0	0.0	0.0

PLOT ER11	1996	1999
SOIL		37.6
ROCK		3.1
BARE	29.3	40.7
LITTER	10.5	8.3
ANN GRAS	25.3	9.0
ANN FORB	16.0	27.8
ISTE	8.5	4.7
ARIS CAN	4.6	1.2
PRGL	2.6	1.6
ERLE CAN	2.3	5.7
MUPO CAN	2.2	0.0
GUSA	1.8	1.3
SPCO CAN	1.6	0.3
EPHEDRA	0.9	0.3
YUEL	0.6	0.0
MUPO BAS	0.4	1.0
SPFL CAN	0.4	0.0
ARIS BAS	0.2	0.2
TAAU	0.2	0.0
DICA CAN	0.2	0.0
SEMA CAN	0.2	0.2
SPCO BAS	0.2	0.2
SPFL BAS	0.2	0.0
BOBA CAN	0.1	0.0
DICA BAS	0.1	0.0
SEMA BAS	0.1	0.1
ERIN CAN	0.1	0.0
BOBA BAS	0.0	0.0
ERIN BAS	0.0	0.0
ERLE BAS	0.0	0.5

PLOT ER12
DATE SEPT 30, 1996

	1	2	3	4	5	6	7	8	9	10	mean	S.E.
BARE	51	29	28	8	17	37	18	33	11	15	24.7	4.2
LITTER	5	8	9	11	2	7	10	5	7	4	6.8	0.9
ANN FORB	12	26	16	24	11	21	32	29	20	15	20.6	2.3
PRGL	1	7	4	2	3	6	5	0	4	4	3.6	0.7
ANN GRAS	11	15	36	43	49	13	27	16	41	51	30.2	5.0
ISTE	4	7	2	4	8	1	5	5	8	2	4.6	0.8
ARIS BAS	1	2	0	0	0	1	0	1	0	0	0.5	0.2
ARIS CAN	8	9	2	3	3	10	2	3	5	1	4.6	1.0
MUPO BAS	0	0	0	0	0	0	0	0	0	0	0.0	0.0
MUPO CAN	0	2	0	1	2	2	3	3	1	2	1.6	0.3
SEMA BAS	0	1	0	0	0	0	0	0	0	1	0.2	0.1
SEMA CAN	1	2	0	0	0	1	0	0	0	2	0.6	0.3
EPHEDRA	0	0	0	0	0	1	0	0	0	0	0.1	0.1
CRCO	2	0	0	1	2	0	0	2	0	0	0.7	0.3
TAAU	0	0	0	0	0	1	0	0	1	1	0.3	0.2
ERLE BAS	0	1	0	1	0	0	0	0	0	0	0.2	0.1
ERLE CAN	5	7	3	13	10	7	5	3	11	8	7.2	1.1
SOEL	0	0	0	0	0	1	0	0	0	0	0.1	0.1
GUSA	0	0	3	4	2	0	2	1	3	0	1.5	0.5
YUEL	1	0	0	0	0	0	0	0	3	1	0.5	0.3
SPCO BAS	0	0	0	1	0	0	0	0	0	0	0.1	0.1
SPCO CAN	0	0	0	1	0	0	0	0	1	2	0.4	0.2
SPFL CAN	0	0	0	1	0	0	0	0	0	0	0.1	0.1

PLOT ER12
DATE 29-Sep-99

	1	2	3	4	5	6	7	8	mean	S.E.
SOIL	53	31	42	29	54	36	32	33	38.8	3.5
ROCK	2	2	0	0	5	2	1	1	1.6	0.6
BARE	55	33	42	29	59	38	33	34	40.4	3.9
LITTER	3	14	3	13	1	7	5	4	6.3	1.7
ANN FORB	7	25	10	15	13	26	28	34	19.8	3.4
PRGL	5	3	4	2	1	3	4	4	3.3	0.5
ANN GRAS	3	5	5	9	4	2	6	12	5.8	1.2
ISTE	9	7	8	16	4	8	8	7	8.4	1.2
ARIS BAS	1	0	2	1	0	0	0	0	0.5	0.3
ARIS CAN	9	4	9	1	1	7	0	1	4.0	1.3
MUPO BAS	0	1	0	0	0	0	0	0	0.1	0.1
MUPO CAN	0	7	2	0	3	3	0	2	2.1	0.8
SEMA BAS	0	0	0	0	0	0	0	0	0.0	0.0
SEMA CAN	0	1	0	1	1	2	1	3	1.1	0.4
EPHEDRA	0	0	1	1	1	0	0	0	0.4	0.2
CRCO	0	0	0	0	1	0	0	0	0.1	0.1
TAAU	0	0	0	0	0	0	0	0	0.0	0.0
ERLE BAS	1	1	0	0	0	1	1	0	0.5	0.2
ERLE CAN	8	4	19	5	14	11	12	10	10.4	1.7
SOEL	0	0	0	0	0	0	0	0	0.0	0.0
GUSA	6	2	5	4	0	1	3	2	2.9	0.7
YUEL	0	0	0	3	0	0	0	1	0.5	0.4
SPCO BAS	0	0	0	0	0	0	0	0	0.0	0.0
SPCO CAN	1	0	0	0	0	0	0	0	0.1	0.1
SPFL CAN	0	0	0	0	0	0	0	0	0.0	0.0

PLOT ER 12	1996	1999
SOIL		38.8
ROCK		1.6
BARE	24.7	40.4
LITTER	6.8	6.3
ANN GRAS	30.2	5.8
ANN FORB	20.6	19.8
ERLE CAN	7.2	10.4
ISTE	4.6	8.4
ARIS CAN	4.6	4.0
PRGL	3.6	3.3
MUPO CAN	1.6	2.1
GUSA	1.5	2.9
CRCO	0.7	0.1
SEMA CAN	0.6	1.1
ARIS BAS	0.5	0.5
YUEL	0.5	0.5
SPCO CAN	0.4	0.1
TAAU	0.3	0.0
SEMA BAS	0.2	0.0
ERLE BAS	0.2	0.5
EPHEDRA	0.1	0.4
SOEL	0.1	0.0
SPCO BAS,	0.1	0.0
SPFL CAN	0.1	0.0
MUPO BAS	0	0.1

SUMMARY TABLE, GEO WRIGHT SITE

PLOT GW1	1996	1999
SOIL		53.2
ROCK		0.7
BARE	54.7	53.9
LITTER	12.5	8.5
PRGL	22.0	7.0
ANN FORB	8.4	11.8
ANN GRASS	2.7	12.3
GUSA	1.0	0.3
HODE	0.5	1.3
PAOB BASAL	0.5	0.0
SEMA BAS	0.3	1.2
SOEL	0.3	0.0
ISTE	0.3	0.2
DESERT BROOM	0.2	0.0
MUPO BAS	0.2	0.0
CRCO	0.2	0.0
BOBA BAS	0.1	0.3
SPSP	0.1	0.0
BOCO	0.1	0.0
ACOU	0.1	0.0
ARIS BAS	0.1	0.1
ARIS CANOPY	0.1	1.7
SILE	0.1	0.0
SCBR BAS	0.1	0.0
SEMA CAN	0.0	3.9
BOBA CAN	0.0	2.2
PAOB CANOPY	0.0	0.7

PLOT GW2	1996	1999
SOIL		41.4
ROCK		1.3
BARE	45.3	42.7
LITTER	11.9	6.1
PRGL	23.0	5.6
ANN FORB	4.3	21.4
ANN GRASS	2.6	11.2
CRCO	2.6	1.0
ARIS BAS	2.4	0.8
ARIS CANOPY	2.4	6.8
GUSA	2.3	1.2
SOEL	0.5	0.5
ZIGR	0.5	1.5
SPSP	0.3	0.0
BOBA BAS	0.2	0.8
BOBA CAN	0.2	0.2
ASTER	0.2	0.1
SEMA BAS	0.1	0.4
SEMA CAN	0.1	3.1
PAOB BASAL	0.1	0.0
SCBR CAN	0.1	0.0
HIMU BAS	0.1	0.1
EVOL	0.1	0.0
HODE	0.0	0.1
DESERT BROOM	0.0	0.0
PAOB CANOPY	0.0	1.1
ERLE BAS	0	0.5
ERLE CAN	0	2.6

PLOT GW3	1996	1999
SOIL		53.4
ROCK		1.7
BARE	65.1	55.1
LITTER	9.9	8.3
PRGL	16.4	2.1
CRCO	2.1	2.3
ARIS CAN	2.0	2.0
FORB	1.0	22.5
ARIS BAS	0.8	0.7
GUSA	0.5	0.0
HIMU CAN	0.5	0.2
MUPO CAN	0.4	0.0
PAOB CAN	0.3	3.0
SEMA CAN	0.2	1.0
HIMU BAS	0.2	0.0
PAOB BAS	0.2	0.4
ISTE	0.2	0.0
DAPU	0.1	0.3
EVOL	0.1	0.0
SILE	0.1	0.0
ACOU	0.1	0.0
SOEL	0.1	0.0
ASTER	0.1	0.1
SEMA BAS	0.0	0.3
MUPO BAS	0.0	0.0
ANN GRASS	0	0.6
ZINNIA	0	1.0

PLOT GW4	1996	1999
SOIL		49.8
ROCK		0.9
BARE	60.6	50.7
LITTER	10.9	10.1
PRGL	17.2	17.3
ARIS CAN	3.8	7.4
CRCO	3.7	4.9
ANN FORB	1.4	5.5
ARIS BAS	1.0	1.5
ANN GRASS	0.5	0.5
PAOB CAN	0.5	1.8
ZIGR	0.5	0.8
GUSA	0.3	0.7
DAPU CAN	0.2	0.3
PAOB BAS	0.2	0.3
SOEL	0.2	0.1
HODE	0.2	0.1
DAPU BAS	0.1	0.4
ACOU	0.1	0
ASTER	0.1	0.7
BAHIA	0.1	0
SPSP	0.1	0.3
MUAR	0.1	0.1
BOCU	0.1	0
TAAU	0.1	0
ERLE CAN	0.1	0.1
KRLA	0.1	0
SCBR	0.1	0

PLOT GW5	1996	1999
SOIL		52.3
ROCK		0.7
BARE	63.8	53.0
LITTER	9.3	6.5
PRGL	9.9	3.4
CRCO	3.7	4.3
ARIS CAN	3.6	3.8
FORB	1.9	13.0
PAOB CAN	1.8	5.2
BOCU CAN	1.5	1.3
MUAR CAN	1.2	0.9
ARIS BAS	1.0	0.1
GUSA	0.7	0.7
BOCU BAS	0.6	0.5
DAPU CAN	0.6	0.8
MUAR BAS	0.5	0.3
BOER CAN	0.5	0.5
ANN GRAS	0.5	2.3
PAOB BAS	0.4	1.0
ASTER	0.4	1.1
ZIGR	0.3	1.2
TAAU	0.3	0.0
DAPU BAS	0.3	0.2
SOEL	0.3	0.0
SILE	0.2	0.1
SEMA CAN	0.2	1.2
HIMU BAS	0.1	0.0
HIMU CAN	0.1	0.0

PLOT GW6	1996	1999
SOIL		41.4
ROCK		0.8
BARE	60.1	42.2
LITTER	8.8	8.8
ARIS CANOP'	11.9	19.9
PRGL	6.0	5.3
ARIS BAS	3.8	3.8
BOER CAN	3.8	4.9
ANN FORB	3.2	8.8
CRCO	3.0	5.1
BOER BAS	1.6	1.7
MUAR CAN	0.7	1.8
SILE	0.6	0.2
PAOB CAN	0.6	1.9
SCBR CAN	0.6	0.8
EVOL	0.4	0.1
ANN GRAS	0.4	0.2
MUAR BAS	0.4	0.6
MUPO CAN	0.3	0.0
ZIGR	0.3	1.0
SCBR BAS	0.3	0.4
HODE	0.2	0.5
PAOB BAS	0.2	0.2
GUSA	0.2	0.2
BOGR CAN	0.2	0.1
SPSP	0.1	0.1
DAPU BAS	0.1	0.1
DAPU CAN	0.1	0.2

PLOT GW7	1996	1999
SOIL		59.1
ROCK		1.6
BARE	68.3	60.7
LITTER	8.2	10.7
PRGL	15.1	14.9
ARIS CANOPY	2.0	4.9
CRCO	2.0	0.5
PAOB CAN	1.4	1.8
MUPO CAN	1.0	0.7
ARIS BAS	0.8	0.5
SEMA CAN	0.8	0.5
GUSA	0.7	0.9
ANN FORB	0.5	2.6
HIMU CAN	0.4	0.6
SILE	0.3	0.1
ZIGR	0.3	0.2
PAOB BAS	0.2	0.1
SEMA BAS	0.2	0.1
DAPU CAN	0.2	0.6
ISTE	0.1	0.9
SOEL	0.1	0
POOB	0.1	0
ANN GRAS	0.1	0.2
DAPU BAS	0.1	0
MUPO BAS	0.0	0.1
HIMU BAS	0.0	0.1

PLOT GW8	1996	1999
SOIL		42.7
ROCK		0.3
BARE	52.9	43.0
LITTER	10.3	10.2
PRGL	17.1	4.4
ARIS CANOPY	12.3	9.7
ANN FORB	3.7	24.7
CRCO	2.8	2.9
ARIS BAS	2.3	1.3
GUSA	1.4	1.6
ZIGR	1.3	1.6
SEMA CAN	0.7	1.4
ERWR	0.7	0.5
ASTER	0.6	0.7
MUPO CAN	0.6	0.1
ISTE	0.5	0.3
SEMA BAS	0.3	0.4
SPSP	0.3	0.1
SCBR CAN	0.3	0
EVOL	0.3	0
ANN GRAS	0.2	1.1
SCBR BAS	0.1	0
SOEL	0.1	0.1
SPFL CAN	0.1	0
BRDE	0.1	0
DECO	0.1	0
SPFL BAS	0	0
MUPO BAS	0	0.1

PLOT GW9	1996	1999
SOIL		33.6
ROCK		0.6
BARE	48.2	34.2
PRGL	17.7	14.2
LITTER	10.5	12.5
ARIS CANOP'	9.8	20.9
ANN FORB	6.4	9.1
CRCO	2.4	1.3
ARIS BAS	2.2	2.3
BRDE	1.4	0
ZIGR	1.2	2.1
ANN GRAS	0.7	4.3
GUSA	0.6	2.2
BOCU CAN	0.6	1.1
SOEL	0.4	0
EVOL	0.4	0.2
MUPO CAN	0.4	0
MIBI	0.3	0.1
SEMA CAN	0.3	1.4
BOGR CAN	0.2	0
ASTER	0.2	0.1
SPSP	0.2	0.1
BOCU BAS	0.2	0.1
ISTE	0.2	0.1
ERWR	0.2	1.5
BOGR BAS	0.1	0
SCBR CAN	0.1	0.1
MUAR CAN	0.1	0

PLOT GW10	1996	1999
SOIL		43.4
ROCK		0.2
BARE	55.3	43.6
LITTER	13.4	9.3
PRGL	23.0	4.8
ANN FORB	2.0	16.8
CRCO	2.2	2.4
ARIS BAS	1.0	1.2
ARIS CANOPY	4.4	8.3
EVOL	0.1	0.1
PAOB BAS	0.1	0.1
PAOB CAN	0.2	0.2
ZIGR	0.3	1.1
BRDE	0.1	0.0
ANN GRAS	0.7	4.3
ERWR	0.2	0.0
SPWR BAS	0.1	0.0
SPWR CAN	0.2	0.0
MUAR BAS	0.0	0.0
MUAR CAN	0.1	0.0
ISTE	0.1	0.0
GUSA	0.1	0.1
SEMA BAS	0.0	1.0
SEMA CAN	0.3	6.5
SPFL CAN	0.1	0.0
SOEL	0.1	0.0
BOCU CAN	0.1	0.3
DICA CAN	0.1	0.3

PLOT GW11	1996	1999
SOIL		53.8
ROCK		0.5
BARE	66.1	54.3
LITTER	9.0	5.2
PRGL	8.0	2.0
ARIS CAN	2.8	4.7
PAOB CAN	2.7	3.6
CRCO	2.5	1.8
SCBR CAN	2.2	1.1
ANN FORB	2.0	21.3
SCBR BAS	1.2	0.2
MUAR CAN	1.1	0.3
EVOL	0.8	0.0
BOGR CAN	0.7	0.1
ANN GRAS	0.6	2.1
TAAU	0.5	0.0
ARIS BAS	0.5	0.5
BOGR BAS	0.5	0.1
MUAR BAS	0.5	0.0
BOER CAN	0.5	0.7
HODE	0.5	0.5
GUSA	0.4	0.5
PAOB BAS	0.4	0.4
ZIGR	0.2	0.5
SILE	0.2	0.4
ASTER	0.1	0.0
BOER BAS	0.1	0.2
SEMA CAN	0.1	1.0
EPHEDRA	0.1	0.0
SOEL	0.1	0.1
SEMA BAS	0.0	0.2

PLOT GW12	1996	1999
SOIL		45.8
ROCK		0.3
BARE	63.5	46.1
LITTER	11.7	7.2
PRGL	5.7	2.9
ARIS CAN	6.9	10
CRCO	3.9	4.2
PAOB CAN	2.9	9.8
BOER CAN	1.6	0.9
ARIS BAS	1.3	1.2
SCBR CAN	1.2	1.2
ANN FORB	1.0	12.6
MUAR CAN	1.0	0.9
SCBR BAS	0.9	0.3
BOER BAS	0.8	0.2
EVOL	0.7	0.9
PAOB BAS	0.5	1.7
ZIGR	0.4	1.0
ISTE	0.4	0.1
MUAR BAS	0.3	0.1
GUSA	0.2	0.1
TAAU	0.1	0
HIMU BAS	0.1	0.2
HIMU CAN	0.1	0.3
ERLE BAS	0.1	0
ERLE CAN	0.1	0
SOEL	0.1	0.1
MUPO CAN	0.1	0
SILE	0.1	0.1
ASTER	0.1	0.9
ANN GRAS	0.1	0.6

PLOT GW1 — Crush & Seed
DATE SEPT 17, 1996

	1	2	3	4	5	6	7	8	9	10	mean
BARE	32	40	57	60	37	42	75	73	61	70	54.7
LITTER	16	16	16	14	11	12	10	10	12	8	12.5
ANN FORB	23	10	0	1	20	16	0	13	1	0	8.4
ANN GRASS	14	0	0	0	8	5	0	0	0	0	2.7
PRGL	30	31	21	26	25	21	15	13	20	18	22
GUSA	4	1	0	0	3	0	0	1	0	1	1
SEMA BAS	0	0	2	0	1	0	0	0	0	0	0.3
SEMA CAN	0	0	0	0	0	0	0	0	0	0	0
HODE	0	3	0	0	1	1	0	0	0	0	0.5
DESERT BROOM	2	0	0	0	0	0	0	0	0	0	0.2
BOBA BAS	1	0	0	0	0	0	0	0	0	0	0.1
BOBA CAN	0	0	0	0	0	0	0	0	0	0	0
PAOB BASAL	0	2	0	0	1	0	0	1	1	0	0.5
PAOB CANOPY	0	0	0	0	0	0	0	0	0	0	0
MUPO BAS	0	1	1	0	0	0	0	0	0	0	0.2
MUPO CAN	0	0	0	0	0	0	0	0	0	0	0
SPSP	0	0	1	0	0	0	0	0	0	0	0.1
CRCO	0	0	1	0	0	0	0	0	0	1	0.2
BOCO	0	0	0	0	0	1	0	0	0	0	0.1
ACOU	0	0	0	0	0	0	0	0	1	0	0.1
ARIS BAS	0	0	0	0	1	0	0	0	0	0	0.1
ARIS CANOPY	0	0	0	0	1	0	0	0	0	0	0.1
SOEL	0	0	0	0	1	2	0	0	0	0	0.3
ISTE	0	0	0	0	1	2	0	0	0	0	0.3
SILE	0	0	0	0	1	0	0	0	0	0	0.1
SCBR BAS	0	0	0	0	0	0	0	1	0	0	0.1
SCBR CAN	0	0	0	0	0	0	0	0	0	0	0

PLOT GW1
DATE SEPT 17, 1996

	1	2	3	4	5	6	7	8	9	10	mean
SOIL	40	28	61	67	69	24	58	57	76	52	53.2
ROCK	0	0	4	1	0	0	0	0	0	2	0.7
BARE	40	28	65	68	69	24	58	57	76	54	53.9
LITTER	5	11	8	3	7	12	6	11	6	16	8.5
ANN FORB	7	24	12	14	12	12	7	9	9	12	11.8
ANN GRASS	24	34	2	2	4	36	7	3	4	7	12.3
PRGL	10	8	10	5	8	9	9	5	1	5	7
GUSA	1	1	1	0	0	0	0	0	0	0	0.3
SEMA BAS	5	2	0	1	0	0	2	0	1	1	1.2
SEMA CAN	12	2	2	3	1	3	5	4	2	5	3.9
HODE	1	1	0	0	0	4	4	3	0	0	1.3
DESERT BROOM	0	0	0	0	0	0	0	0	0	0	0
BOBA BAS	0	1	0	0	0	2	0	0	0	0	0.3
BOBA CAN	2	6	0	1	0	13	0	0	0	0	2.2

PAOB BASAL	0	0	0	0	0	0	0	0	0	0	0
PAOB CANOPY	0	0	1	0	0	1	3	2	0	0	0.7
MUPO BAS	0	0	0	0	0	0	0	0	0	0	0
MUPO CAN	0	0	0	0	0	0	0	0	0	0	0
SPSP	0	0	0	0	0	0	0	0	0	0	0
CRCO	0	0	0	0	0	0	0	0	0	0	0
BOCO	0	0	0	0	0	0	0	0	0	0	0
ACOU	0	0	0	0	0	0	0	0	0	0	0
ARIS BAS	0	0	0	0	0	1	0	0	0	0	0.1
ARIS CANOPY	3	4	0	1	1	4	2	2	0	0	1.7
SOEL	0	0	0	0	0	0	0	0	0	0	0
ISTE	0	1	0	0	0	0	0	0	0	1	0.2
SILE	0	0	0	0	0	0	0	0	0	0	0
SCBR BAS	0	0	0	0	0	0	0	0	0	0	0
SCBR CAN	0	0	0	0	0	0	0	0	0	0	0

	1996	1999	
SOIL		53.2	
ROCK		0.7	
BARE	54.7	53.9	−
LITTER	12.5	8.5	−
ANN FORB	8.4	11.8	+
ANN GRASS	2.7	12.3	+
PRGL	22.0	7.0	−
GUSA - snakeweed	1.0	0.3	
SEMA BAS (plains bristlegrass)	0.3	1.2	+
SEMA CAN (plains bristlegrass)	0.0	3.9	+
HODE	0.5	1.3	+
DESERT BROOM	0.2	0.0	
BOBA BAS (cane bluestem)	0.1	0.3	+
BOBA CAN (cane bluestem)	0.0	2.2	+
PAOB BASAL (obtuse panicgrass)	0.5	0.0	
PAOB CANOPY (obtuse panicgrass)	0.0	0.7	+
MUPO BAS (bush muhly)	0.2	0.0	
MUPO CAN (bush muhly)	0.0	0.0	
SPSP - desert needlegrass	0.1	0.0	
CRCO - pygmyweed	0.2	0.0	
BOCO - scarlet spiderling	0.1	0.0	
ACOU -	0.1	0.0	
ARIS BAS (three awn)	0.1	0.1	
ARIS CANOPY (three awn)	0.1	1.7	+
SOEL	0.3	0.0	
ISTE	0.3	0.2	
SILE	0.1	0.0	
SCBR BAS (burrograss)	0.1	0.0	
SCBR CAN (burrograss)	0.0	0.0	

PLOT	GW2 – Creek									
DATE	9/17/96									
	1	2	3	4	5	6	7	8	9	10
BARE	49	34	42	47	40	57	49	43	50	42
LITTER	7	14	14	15	17	3	8	12	13	16
ANN FORB	4	5	4	1	6	5	2	10	4	2
ANN GRASS	4	5	1	3	0	0	6	6	0	1
PRGL	24	26	20	21	17	24	28	26	20	24
GUSA	3	1	4	2	2	1	1	4	4	1
SEMA BAS	0	1	0	0	0	0	0	0	0	0
SEMA CAN	0	1	0	0	0	0	0	0	0	0
HODE	0	0	0	0	0	0	0	0	0	0
DESERT BROOM	0	0	0	0	0	0	0	0	0	0
BOBA BAS	0	0	0	0	0	0	2	0	0	0
BOBA CAN	0	0	0	0	0	0	2	0	0	0
PAOB BASAL	1	0	0	0	0	0	0	0	0	0
PAOB CANOPY	0	0	0	0	0	0	0	0	0	0
SPSP	0	0	0	0	1	0	0	0	2	0
CRCO	0	1	3	1	9	5	1	1	0	5
BOCO	0	0	0	0	0	0	0	0	0	0
ACOU	0	0	0	0	0	0	0	0	0	0
ARIS BAS	1	1	3	5	1	2	1	1	5	4
ARIS CANOPY	1	1	3	5	1	2	1	1	5	4
SOEL	0	0	1	2	1	0	0	0	0	1
ISTE	0	0	0	0	0	0	0	0	0	0
SILE	0	0	0	0	0	0	0	0	0	0
SCBR BAS	0	0	0	0	0	0	0	0	0	0
SCBR CAN	0	0	0	0	0	0	0	0	1	0
ZIGR	0	0	1	0	1	1	1	0	1	0
HIMU BAS	0	0	0	0	0	1	0	0	0	0
EVOL	0	0	0	0	0	1	0	0	0	0
ASTER	0	0	0	0	0	0	1	0	0	1

PLOT	GW2									
DATE	13-Oct-99									
	1	2	3	4	5	6	7	8	9	10
SOIL	52	30	54	43	56	30	29	32	40	48
ROCK	1	3	2	0	1	2	2	0	1	1
BARE	53	33	56	43	57	32	31	32	41	49
LITTER	7	9	5	7	9	3	9	2	6	4
ANN FORB	10	18	20	25	11	25	30	23	21	31
ANN GRASS	7	21	6	3	4	23	19	15	11	3
PRGL	8	10	1	10	2	4	5	10	2	4
GUSA	0	1	2	4	1	1	1	1	0	1
SEMA BAS	0	0	1	1	0	1	0	0	1	0
SEMA CAN	2	0	1	3	1	11	3	6	2	2
HODE	1	0	0	0	0	0	0	0	0	0
DESERT BROOM	0	0	0	0	0	0	0	0	0	0
BOBA BAS	1	1	6	0	0	0	0	0	0	0
BOBA CAN	0	0	2	0	0	0	0	0	0	0

PAOB BASAL	0	0	0	0	0	0	0	0	0	0
PAOB CANOPY	2	3	2	0	0	0	0	0	2	2
SPSP	0	0	0	0	0	0	0	0	0	0
CRCO	1	2	6	1	0	0	0	0	0	0
BOCO	0	0	0	0	0	0	0	0	0	0
ACOU	0	0	0	0	0	0	0	0	0	0
ARIS BAS	0	0	0	3	0	1	1	0	3	0
ARIS CANOPY	2	5	4	10	5	1	7	13	16	5
SOEL	1	2	1	1	0	0	0	0	0	0
ISTE	0	0	0	0	0	0	0	0	0	0
SILE	0	0	0	0	0	0	0	0	0	0
SCBR BAS	0	0	0	0	0	0	0	0	0	0
SCBR CAN	0	0	0	0	0	0	0	0	0	0
ZIGR	0	1	2	1	6	0	2	2	1	0
HIMU BAS	0	0	0	0	0	0	0	0	1	0
EVOL	0	0	0	0	0	0	0	0	0	0
ASTER	1	0	0	0	0	0	0	0	0	0
ERLE BAS	2	1	0	0	1	1	0	0	0	0
ERLE CAN	8	5	1	0	1	5	6	0	0	0

	1996	1999
SOIL		41.4
ROCK		1.3
BARE	45.3	42.7
LITTER	11.9	6.1
PRGL	23.0	5.6
ANN FORB	4.3	21.4
ANN GRASS	2.6	11.2
CRCO	2.6	1.0
ARIS BAS	2.4	0.8
ARIS CANOPY	2.4	6.8
GUSA	2.3	1.2
SOEL	0.5	0.5
ZIGR	0.5	1.5
SPSP	0.3	0.0
BOBA BAS	0.2	0.8
BOBA CAN	0.2	0.2
ASTER	0.2	0.1
SEMA BAS	0.1	0.4
SEMA CAN	0.1	3.1
PAOB BASAL	0.1	0.0
SCBR CAN	0.1	0.0
HIMU BAS	0.1	0.1
EVOL	0.1	0.0
HODE	0.0	0.1
DESERT BROOM	0.0	0.0
PAOB CANOPY	0.0	1.1
BOCO	0.0	0.0
ACOU	0.0	0.0
ISTE	0.0	0.0

SILE	0.0	0.0
SCBR BAS	0.0	0.0
ERLE BAS	0	0.5
ERLE CAN	0	2.6

MEAN
45.3
11.9
4.3
2.6
23.0
2.3
0.1
0.1
0.0
0.0
0.2
0.2
0.1
0.0
0.3
2.6
0.0
0.0
2.4
2.4
0.5
0.0
0.0
0.0
0.1
0.5
0.1
0.1
0.2

MEAN
41.4
1.3
42.7
6.1
21.4
11.2
5.6
1.2
0.4
3.1
0.1
0.0
0.8
0.2

PLOT	GW3 - Grab									
DATE	9/18/96									
	1	2	3	4	5	6	7	8	9	10
BARE	65	69	62	66	70	68	69	56	62	64
LITTER	12	11	8	9	10	14	8	8	9	10
FORB	5	1	1	1	1	1	0	0	0	0
PRGL	5	16	16	22	20	14	12	19	22	18
GUSA	1	1	1	1	1	0	0	0	0	0
SEMA BAS	0	0	0	0	0	0	0	0	0	0
SEMA CAN	1	1	0	0	0	0	0	0	0	0
DAPU	1	0	0	0	0	0	0	0	0	0
HIMU BAS	2	0	0	0	0	0	0	0	0	0
HIMU CAN	5	0	0	0	0	0	0	0	0	0
PAOB BAS	1	1	0	0	0	0	0	0	0	0
PAOB CAN	1	2	0	0	0	0	0	0	0	0
CRCO	4	3	2	2	1	1	5	2	1	0
ARIS BAS	1	0	4	2	1	0	0	0	0	0
ARIS CAN	4	2	5	3	2	2	1	1	0	0
EVOL	1	0	0	0	0	0	0	0	0	0
MUPO BAS	0	0	0	0	0	0	0	0	0	0
MUPO CAN	2	1	1	0	0	0	0	0	0	0
ISTE	1	1	0	0	0	0	0	0	0	0
SILE	1	0	0	0	0	0	0	0	0	0
ACOU	1	0	0	0	0	0	0	0	0	0
SOEL	1	0	0	0	0	0	0	0	0	0
ASTER	1	0	0	0	0	0	0	0	0	0

PLOT	GW3									
DATE	13-Oct-99									
	1	2	3	4	5	6	7	8	9	10
SOIL	47	55	64	57	46	58	53	64	39	51
ROCK	1	5	7	0	1	1	1	0	0	1
BARE	48	60	71	57	47	59	54	64	39	52
LITTER	5	9	7	4	6	7	10	7	15	13
FORB	24	20	16	24	32	21	23	17	28	20
PRGL	1	1	1	2	6	0	1	0	5	4
GUSA	0	0	0	0	0	0	0	0	0	0
SEMA BAS	0	0	0	0	1	0	1	0	1	0
SEMA CAN	0	0	0	1	3	1	0	0	4	1
DAPU	3	0	0	0	0	0	0	0	0	0
HIMU BAS	0	0	0	0	0	0	0	0	0	0
HIMU CAN	2	0	0	0	0	0	0	0	0	0
PAOB BAS	0	0	1	0	0	0	1	2	0	0
PAOB CAN	5	1	3	3	0	3	5	6	2	2
CRCO	2	1	0	8	3	2	0	4	1	2
ARIS BAS	1	2	0	1	1	0	0	0	2	0
ARIS CAN	4	3	0	6	2	3	0	0	3	0
EVOL	0	0	0	0	0	0	0	0	0	0
MUPO BAS	0	0	0	0	0	0	0	0	0	0
MUPO CAN	0	0	0	0	0	0	0	0	0	0

ISTE	0	0	0	0	0	0	0	0	0	0
SILE	0	0	0	0	0	0	0	0	0	0
ACOU	0	0	0	0	0	0	0	0	0	0
SOEL	0	0	0	0	0	0	0	0	0	0
ASTER	1	0	0	0	0	0	0	0	0	0
ANN GRASS	1	0	0	0	1	0	1	0	0	3
ZINNIA	1	2	1	0	1	2	0	1	1	1

	1996	1999
SOIL		53.4
ROCK		1.7
BARE	65.1	55.1
LITTER	9.9	8.3
PRGL	16.4	2.1
CRCO	2.1	2.3
ARIS CAN	2.0	2.0
FORB	1.0	22.5
ARIS BAS	0.8	0.7
GUSA	0.5	0.0
HIMU CAN	0.5	0.2
MUPO CAN	0.4	0.0
PAOB CAN	0.3	3.0
SEMA CAN	0.2	1.0
HIMU BAS	0.2	0.0
PAOB BAS	0.2	0.4
ISTE	0.2	0.0
DAPU	0.1	0.3
EVOL	0.1	0.0
SILE	0.1	0.0
ACOU	0.1	0.0
SOEL	0.1	0.0
ASTER	0.1	0.1
SEMA BAS	0.0	0.3
MUPO BAS	0.0	0.0
ANN GRASS	0	0.6
ZINNIA	0	1.0

MEAN

65.1
9.9
1.0
16.4
0.5
0.0
0.2
0.1
0.2
0.5
0.2
0.3
2.1
0.8
2.0
0.1
0.0
0.4
0.2
0.1
0.1
0.1
0.1

MEAN

53.4
1.7
55.1
8.3
22.5
2.1
0.0
0.3
1.0
0.3
0.0
0.2
0.4
3.0
2.3
0.7
2.0
0.0
0.0
0.0

PLOT	GW4 - Control									
DATE	9/18/96									
	1	2	3	4	5	6	7	8	9	10
BARE	60	47	59	60	64	61	62	56	66	71
LITTER	10	10	16	13	6	16	14	6	12	6
ANN FORB	1	1	4	4	4	0	0	0	0	0
ANN GRASS	1	1	3	0	0	0	0	0	0	0
PRGL	18	23	19	10	9	17	29	19	20	8
GUSA	1	1	1	0	0	0	0	0	0	0
DAPU BAS	1	0	0	0	0	0	0	0	0	0
DAPU CAN	2	0	0	0	0	0	0	0	0	0
PAOB BAS	1	1	0	0	0	0	0	0	0	0
PAOB CAN	2	2	1	0	0	0	0	0	0	0
CRCO	1	2	3	5	7	4	2	5	5	3
ARIS BAS	2	1	1	1	1	2	1	1	0	0
ARIS CAN	3	3	3	3	6	4	3	4	2	7
ACOU	1	0	0	0	0	0	0	0	0	0
SOEL	1	1	0	0	0	0	0	0	0	0
ASTER	1	0	0	0	0	0	0	0	0	0
HODE	1	1	0	0	0	0	0	0	0	0
ZIGR	1	1	1	2	0	0	0	0	0	0
BAHIA	1	0	0	0	0	0	0	0	0	0
SPSP	1	0	0	0	0	0	0	0	0	0
MUAR	1	0	0	0	0	0	0	0	0	0
BOCU	1	0	0	0	0	0	0	0	0	0
TAAU	1	0	0	0	0	0	0	0	0	0
ERLE CAN	1	0	0	0	0	0	0	0	0	0
KRLA	1	0	0	0	0	0	0	0	0	0
SCBR	1	0	0	0	0	0	0	0	0	0

PLOT	GW4									
DATE	13-Oct-99									
	1	2	3	4	5	6	7	8	9	10
SOIL	59	52	51	61	40	64	46	40	48	37
ROCK	0	2	0	1	0	2	1	3	0	0
BARE	59	54	51	62	40	66	47	43	48	37
LITTER	7	12	10	12	8	5	11	20	7	9
ANN FORB	6	2	5	2	11	3	2	8	5	11
ANN GRASS	0	0	0	0	0	0	0	2	0	3
PRGL	21	20	22	7	21	17	27	8	21	9
GUSA	1	2	1	0	0	0	0	1	2	0
DAPU BAS	0	0	0	0	0	0	0	0	0	0
DAPU CAN	0	0	2	0	1	0	0	1	0	0
PAOB BAS	1	0	0	0	1	0	0	0	0	1
PAOB CAN	2	0	0	1	2	1	1	1	0	10
CRCO	1	0	6	8	7	2	4	7	10	4
ARIS BAS	2	1	2	1	3	1	0	1	1	3
ARIS CAN	4	9	3	12	11	4	3	7	7	14
ACOU	0	0	0	0	0	0	0	0	0	0
SOEL	1	0	0	0	0	0	0	0	0	0

ASTER	4	1	2	0	0	0	0	0	0	0
HODE	1	0	0	0	0	0	0	0	0	0
ZIGR	0	2	0	0	0	1	0	1	2	2
BAHIA	0	0	0	0	0	0	0	0	0	0
SPSP	1	2	0	0	0	0	0	0	0	0
MUAR	1	0	0	0	0	0	0	0	0	0
BOCU	0	0	0	0	0	0	0	0	0	0
TAAU	0	0	0	0	0	0	0	0	0	0
ERLE CAN	1	0	0	0	0	0	0	0	0	0
KRLA	0	0	0	0	0	0	0	0	0	0
SCBR	0	0	0	0	0	0	0	0	0	0

	1996	1999
SOIL		49.8
ROCK		0.9
BARE	60.6	50.7
LITTER	10.9	10.1
PRGL	17.2	17.3
ARIS CAN	3.8	7.4
CRCO	3.7	4.9
ANN FORB	1.4	5.5
ARIS BAS	1.0	1.5
ANN GRASS	0.5	0.5
PAOB CAN	0.5	1.8
ZIGR	0.5	0.8
GUSA	0.3	0.7
DAPU CAN	0.2	0.3
PAOB BAS	0.2	0.3
SOEL	0.2	0.1
HODE	0.2	0.1
DAPU BAS	0.1	0.4
ACOU	0.1	0
ASTER	0.1	0.7
BAHIA	0.1	0
SPSP	0.1	0.3
MUAR	0.1	0.1
BOCU	0.1	0
TAAU	0.1	0
ERLE CAN	0.1	0.1
KRLA	0.1	0
SCBR	0.1	0

MEAN
60.6
10.9
1.4
0.5
17.2
0.3
0.1
0.2
0.2
0.5
3.7
1.0
3.8
0.1
0.2
0.1
0.2
0.5
0.1
0.1
0.1
0.1
0.1
0.1
0.1
0.1

MEAN
49.8
0.9
50.7
10.1
5.5
0.5
17.3
0.7
0.4
0.3
0.3
1.8
4.9
1.5
7.4
0.0
0.1

PLOT GW5 - Crush + Seed
DATE 9/18/96

	1	2	3	4	5	6	7	8	9	10	MEAN
BARE	64	58	56	70	58	62	70	67	67	66	63.8
LITTER	11	7	13	8	18	9	6	5	6	10	9.3
FORB	2	1	1	1	2	4	2	5	1	0	1.9
PRGL	9	6	9	10	9	9	18	16	7	6	9.9
PAOB BAS	2	1	1	0	0	0	0	0	0	0	0.4
PAOB CAN	4	3	7	3	1	0	0	0	0	0	1.8
ARIS BAS	1	2	2	1	1	1	2	0	0	0	1.0
ARIS CAN	6	3	7	2	3	3	6	2	1	3	3.6
CRCO	3	2	6	5	3	6	8	3	1	0	3.7
HIMU BAS	1	0	0	0	0	0	0	0	0	0	0.1
HIMU CAN	1	0	0	0	0	0	0	0	0	0	0.1
HODE	1	0	0	0	0	0	0	0	0	0	0.1
BOCU BAS	2	1	1	1	1	0	0	0	0	0	0.6
BOCU CAN	3	3	2	4	2	1	0	0	0	0	1.5
MUAR BAS	1	2	1	1	0	0	0	0	0	0	0.5
MUAR CAN	3	3	3	2	1	0	0	0	0	0	1.2
SILE	1	1	0	0	0	0	0	0	0	0	0.2
EVOL	1	0	0	0	0	0	0	0	0	0	0.1
BOER BAS	1	0	0	0	0	0	0	0	0	0	0.1
BOER CAN	3	1	1	0	0	0	0	0	0	0	0.5
TAAU	1	1	1	0	0	0	0	0	0	0	0.3
GUSA	2	1	1	1	1	1	0	0	0	0	0.7
DAPU BAS	2	1	0	0	0	0	0	0	0	0	0.3
DAPU CAN	4	2	0	0	0	0	0	0	0	0	0.6
ANN GRAS	2	1	1	1	0	0	0	0	0	0	0.5
SCBR CAN	1	0	0	0	0	0	0	0	0	0	0.1
SEMA BAS	0	0	0	0	0	0	0	0	0	0	0.0
SEMA CAN	2	0	0	0	0	0	0	0	0	0	0.2
ZIGR	1	1	1		0	0	0	0	0	0	0.3
ASTER	1	1	1	1	0	0	0	0	0	0	0.4
MUPO BAS	0	0	0	0	0	0	0	0	0	0	0.0
MUPO CAN	1	0	0	0	0	0	0	0	0	0	0.1
SPFL CAN	1	0	0	0	0	0	0	0	0	0	0.1
ACOU	1	0	0	0	0	0	0	0	0	0	0.1
SOEL	1	2	0	0	0	0	0	0	0	0	0.3

PLOT GW5
DATE 13-Oct-99

	1	2	3	4	5	6	7	8	9	10	MEAN
SOIL	50	52	57	50	54	42	58	50	64	46	52.3
ROCK	0	2	1	1	2	1	0	0	0	0	0.7
BARE	50	54	58	51	56	43	58	50	64	46	53.0
LITTER	6	6	4	5	7	5	7	8	4	13	6.5
FORB	20	13	15	14	11	12	8	16	5	16	13.0
PRGL	5	2	2	1	3	6	6	5	4	0	3.4
PAOB BAS	1	1	4	0	0	4	0	0	0	0	1.0
PAOB CAN	11	12	7	6	3	8	1	2	2	0	5.2

ARIS BAS	0	0	0	0	1	0	0	0	0	0	0.1
ARIS CAN	4	2	0	6	3	7	5	1	5	5	3.8
CRCO	1	3	5	3	4	7	6	5	6	3	4.3
HIMU BAS	0	0	0	0	0	0	0	0	0	0	0.0
HIMU CAN	0	0	0	0	0	0	0	0	0	0	0.0
HODE	1	1	0	0	0	0	0	0	0	0	0.2
BOCU BAS	0	1	0	2	1	0	0	1	0	0	0.5
BOCU CAN	0	1	0	2	3	1	1	3	2	0	1.3
MUAR BAS	0	0	0	1	1	0	0	0	0	1	0.3
MUAR CAN	1	0	0	2	2	1	0	1	0	2	0.9
SILE	1	0	0	0	0	0	0	0	0	0	0.1
EVOL	1	1	0	0	0	0	0	0	0	0	0.2
BOER BAS	1	1	0	0	0	0	0	0	0	0	0.2
BOER CAN	3	2	0	0	0	0	0	0	0	0	0.5
TAAU	0	0	0	0	0	0	0	0	0	0	0.0
GUSA	1	0	0	2	0	1	0	0	2	1	0.7
DAPU BAS	2	0	0	0	0	0	0	0	0	0	0.2
DAPU CAN	2	1	1	1	1	1	1	0	0	0	0.8
ANN GRAS	0	0	1	0	7	3	1	5	1	5	2.3
SCBR CAN	2	3	0	0	0	0	0	0	0	0	0.5
SEMA BAS	0	0	2	0	0	0	2	0	0	0	0.4
SEMA CAN	0	3	2	0	0	2	3	1	1	0	1.2
ZIGR	4	2	0	0	0	2	1	2	0	1	1.2
ASTER	0	3	3	1	0	1	1	1	1	0	1.1
MUPO BAS	0	0	0	0	0	0	0	0	0	0	0.0
MUPO CAN	0	0	0	0	0	0	0	0	0	0	0.0
SPFL CAN	0	0	0	0	0	0	0	0	0	0	0.0
ACOU	0	0	0	0	0	0	0	0	0	0	0.0
SOEL	0	0	0	0	0	0	0	0	0	0	0.0

	1996	1999
SOIL		52.3
ROCK		0.7
BARE	63.8	53.0
LITTER	9.3	6.5
PRGL	9.9	3.4
CRCO	3.7	4.3
ARIS CAN	3.6	3.8
FORB	1.9	13.0
PAOB CAN	1.8	5.2
BOCU CAN	1.5	1.3
MUAR CAN	1.2	0.9
ARIS BAS	1.0	0.1
GUSA	0.7	0.7
BOCU BAS	0.6	0.5
DAPU CAN	0.6	0.8
MUAR BAS	0.5	0.3
BOER CAN	0.5	0.5
ANN GRAS	0.5	2.3
PAOB BAS	0.4	1.0

ASTER	0.4	1.1
ZIGR	0.3	1.2
TAAU	0.3	0.0
DAPU BAS	0.3	0.2
SOEL	0.3	0.0
SILE	0.2	0.1
SEMA CAN	0.2	1.2
HIMU BAS	0.1	0.0
HIMU CAN	0.1	0.0
HODE	0.1	0.2
EVOL	0.1	0.2
BOER BAS	0.1	0.2
SCBR CAN	0.1	0.5
MUPO CAN	0.1	0.0
SPFL CAN	0.1	0.0
ACOU	0.1	0.0
SEMA BAS	0.0	0.4
MUPO BAS	0.0	0.0

PLOT	GW 6 – Control										
DATE	9/18/96										
	1	2	3	4	5	6	7	8	9	10	MEAN
BARE	71	66	54	53	70	59	59	55	57	57	60.1
LITTER	10	11	9	6	7	11	7	8	11	8	8.8
PRGL	4	12	12	4	9	1	1	3	12	2	6.0
ANN FORB	3	3	3	2	2	5	5	3	1	5	3.2
ARIS BAS	5	2	4	3	4	5	4	5	3	3	3.8
ARIS CANOPY	16	10	15	10	7	8	11	17	16	9	11.9
CRCO	3	6	4	1	2	4	5	5	0	0	3.0
EVOL	1	1	2	0	0	0	0	0	0	0	0.4
BOER BAS	2	3	2	2	5	2	0	0	0	0	1.6
BOER CAN	3	4	8	4	7	4	2	3	3	0	3.8
ANN GRAS	1	1	2	0	0	0	0	0	0	0	0.4
SILE	2	1	2	1	0	0	0	0	0	0	0.6
HODE	1	1	0	0	0	0	0	0	0	0	0.2
SPSP	1	0	0	0	0	0	0	0	0	0	0.1
MUAR BAS	2	1	1	0	0	0	0	0	0	0	0.4
MUAR CAN	3	2	2	0	0	0	0	0	0	0	0.7
PAOB BAS	1	1	0	0	0	0	0	0	0	0	0.2
PAOB CAN	2	2	2	0	0	0	0	0	0	0	0.6
MUPO BAS	0	0	0	0	0	0	0	0	0	0	0.0
MUPO CAN	3	0	0	0	0	0	0	0	0	0	0.3
ZIGR	2	1	0	0	0	0	0	0	0	0	0.3
DAPU BAS	1	0	0	0	0	0	0	0	0	0	0.1
DAPU CAN	1	0	0	0	0	0	0	0	0	0	0.1
SOEL	1	0	0	0	0	0	0	0	0	0	0.1
GUSA	1	1	0	0	0	0	0	0	0	0	0.2
TAAU	1	0	0	0	0	0	0	0	0	0	0.1
BOGR BAS	1	0	0	0	0	0	0	0	0	0	0.1
BOGR CAN	2	0	0	0	0	0	0	0	0	0	0.2
SCBR BAS	3	0	0	0	0	0	0	0	0	0	0.3
SCBR CAN	4	2	0	0	0	0	0	0	0	0	0.6

PLOT	GW 6										
DATE	13-Oct-99										
	1	2	3	4	5	6	7	8	9	10	MEAN
SOIL	43	55	40	35	45	43	50	31	34	38	41.4
ROCK	0	0	2	1	1	0	1	1	1	1	0.8
BARE	43	55	42	36	46	43	51	32	35	39	42.2
LITTER	1	5	6	9	7	14	5	20	8	13	8.8
PRGL	5	7	11	5	10	0	3	2	10	0	5.3
ANN FORB	17	10	9	6	2	12	9	7	10	6	8.8
ARIS BAS	2	3	2	9	3	2	2	4	3	8	3.8
ARIS CANOPY	21	10	20	38	17	17	15	24	16	21	19.9
CRCO	7	2	7	4	5	5	3	6	7	5	5.1
EVOL	1	0	0	0	0	0	0	0	0	0	0.1
BOER BAS	1	2	1	2	4	1	1	2	2	1	1.7
BOER CAN	2	5	1	6	9	6	3	6	9	2	4.9
ANN GRAS	1	1	0	0	0	0	0	0	0	0	0.2

SILE	1	1	0	0	0	0	0	0	0	0	0.2
HODE	2	2	1	0	0	0	0	0	0	0	0.5
SPSP	1	0	0	0	0	0	0	0	0	0	0.1
MUAR BAS	0	1	1	1	1	1	0	1	0	0	0.6
MUAR CAN	2	2	2	1	1	3	1	2	3	1	1.8
PAOB BAS	0	0	0	0	1	0	0	0	0	1	0.2
PAOB CAN	3	1	0	1	1	1	1	3	2	6	1.9
MUPO BAS	0	0	0	0	0	0	0	0	0	0	0.0
MUPO CAN	0	0	0	0	0	0	0	0	0	0	0.0
ZIGR	0	0	1	0	1	0	2	4	1	1	1.0
DAPU BAS	1	0	0	0	0	0	0	0	0	0	0.1
DAPU CAN	0	1	1	0	0	0	0	0	0	0	0.2
SOEL	0	0	0	0	0	0	0	0	0	0	0.0
GUSA	1	1	0	0	0	0	0	0	0	0	0.2
TAAU	0	0	0	0	0	0	0	0	0	0	0.0
BOGR BAS	1	0	0	0	0	0	0	0	0	0	0.1
BOGR CAN	1	0	0	0	0	0	0	0	0	0	0.1
SCBR BAS	2	2	0	0	0	0	0	0	0	0	0.4
SCBR CAN	3	3	1	1	0	0	0	0	0	0	0.8

	1996	1999
SOIL		41.4
ROCK		0.8
BARE	60.1	42.2
LITTER	8.8	8.8
ARIS CANOPY	11.9	19.9
PRGL	6.0	5.3
ARIS BAS	3.8	3.8
BOER CAN	3.8	4.9
ANN FORB	3.2	8.8
CRCO	3.0	5.1
BOER BAS	1.6	1.7
MUAR CAN	0.7	1.8
SILE	0.6	0.2
PAOB CAN	0.6	1.9
SCBR CAN	0.6	0.8
EVOL	0.4	0.1
ANN GRAS	0.4	0.2
MUAR BAS	0.4	0.6
MUPO CAN	0.3	0.0
ZIGR	0.3	1.0
SCBR BAS	0.3	0.4
HODE	0.2	0.5
PAOB BAS	0.2	0.2
GUSA	0.2	0.2
BOGR CAN	0.2	0.1
SPSP	0.1	0.1
DAPU BAS	0.1	0.1
DAPU CAN	0.1	0.2
SOEL	0.1	0.0

PLOT	GW07 - Control										
DATE	9/19/96										
	1	2	3	4	5	6	7	8	9	10	MEAN
BARE	60	71	68	64	73	65	74	68	70	70	68.3
LITTER	11	9	9	11	7	11	5	7	7	5	8.2
PRGL	15	17	20	11	18	23	13	10	15	9	15.1
ANN FORB	1	1	1	1	1	0	0	0	0	0	0.5
ARIS BAS	1	2	1	1	1	1	1	0	0	0	0.8
ARIS CANOPY	2	5	2	2	5	2	2	0	0	0	2.0
MUPO BAS	0	0	0	0	0	0	0	0	0	0	0.0
MUPO CAN	3	1	4	1	1	0	0	0	0	0	1.0
GUSA	2	2	2	1	0	0	0	0	0	0	0.7
PAOB BAS	1	1	0	0	0	0	0	0	0	0	0.2
PAOB CAN	4	2	1	4	2	1	0	0	0	0	1.4
CRCO	2	3	2	3	1	2	5	2	0	0	2.0
SILE	1	1	1	0	0	0	0	0	0	0	0.3
SEMA BAS	1	1	0	0	0	0	0	0	0	0	0.2
SEMA CAN	2	2	1	1	2	0	0	0	0	0	0.8
HIMU BAS	0	0	0	0	0	0	0	0	0	0	0.0
HIMU CAN	1	3	0	0	0	0	0	0	0	0	0.4
ISTE	1	0	0	0	0	0	0	0	0	0	0.1
SOEL	1	0	0	0	0	0	0	0	0	0	0.1
POOB	1	0	0	0	0	0	0	0	0	0	0.1
ZIGR	1	1	1	0	0	0	0	0	0	0	0.3
ANN GRAS	1	0	0	0	0	0	0	0	0	0	0.1
DAPU BAS	1	0	0	0	0	0	0	0	0	0	0.1
DAPU CAN	2	0	0	0	0	0	0	0	0	0	0.2

PLOT	GW07										
DATE	14-Oct-99										
	1	2	3	4	5	6	7	8	9	10	MEAN
SOIL	66	73	63	65	60	61	47	47	47	62	59.1
ROCK	2	3	0	2	1	2	0	4	1	1	1.6
BARE	68	76	63	67	61	63	47	51	48	63	60.7
LITTER	7	7	6	10	11	12	14	17	12	11	10.7
PRGL	19	11	21	6	20	15	16	13	21	7	14.9
ANN FORB	2	1	2	4	1	1	5	2	3	5	2.6
ARIS BAS	0	0	0	0	2	0	2	1	0	0	0.5
ARIS CANOPY	2	2	2	5	3	4	10	5	9	7	4.9
MUPO BAS	0	0	0	0	0	0	0	0	0	1	0.1
MUPO CAN	1	1	0	0	0	1	0	3	1	0	0.7
GUSA	2	1	1	1	0	0	0	1	3	0	0.9
PAOB BAS	0	0	0	0	0	0	0	1	0	0	0.1
PAOB CAN	5	1	0	1	3	1	0	6	1	0	1.8
CRCO	1	2	2	0	0	0	0	0	0	0	0.5
SILE	1	0	0	0	0	0	0	0	0	0	0.1
SEMA BAS	1	0	0	0	0	0	0	0	0	0	0.1
SEMA CAN	2	0	1	0	1	0	1	0	0	0	0.5
HIMU BAS	0	0	0	0	0	0	0	1	0	0	0.1
HIMU CAN	0	0	0	4	0	0	0	2	0	0	0.6

ISTE	0	1	0	2	2	1	0	2	1	0	0.9
SOEL	0	0	0	0	0	0	0	0	0	0	0.0
POOB	0	0	0	0	0	0	0	0	0	0	0.0
ZIGR	1	1	0	0	0	0	0	0	0	0	0.2
ANN GRAS	2	0	0	0	0	0	0	0	0	0	0.2
DAPU BAS	0	0	0	0	0	0	0	0	0	0	0.0
DAPU CAN	1	1	4	0	0	0	0	0	0	0	0.6

	1996	1999
SOIL		59.1
ROCK		1.6
BARE	68.3	60.7
LITTER	8.2	10.7
PRGL	15.1	14.9
ARIS CANOPY	2.0	4.9
CRCO	2.0	0.5
PAOB CAN	1.4	1.8
MUPO CAN	1.0	0.7
ARIS BAS	0.8	0.5
SEMA CAN	0.8	0.5
GUSA	0.7	0.9
ANN FORB	0.5	2.6
HIMU CAN	0.4	0.6
SILE	0.3	0.1
ZIGR	0.3	0.2
PAOB BAS	0.2	0.1
SEMA BAS	0.2	0.1
DAPU CAN	0.2	0.6
ISTE	0.1	0.9
SOEL	0.1	0
POOB	0.1	0
ANN GRAS	0.1	0.2
DAPU BAS	0.1	0
MUPO BAS	0.0	0.1
HIMU BAS	0.0	0.1

PLOT GW8 - Crush
DATE 9/19/96

	1	2	3	4	5	6	7	8	9	10	MEAN
BARE	54	51	60	58	54	42	70	57	47	36	52.9
LITTER	8	12	14	11	12	9	9	6	14	8	10.3
PRGL	15	17	13	20	14	21	12	15	29	15	17.1
ANN FORB	3	3	3	5	6	4	5	8	0	0	3.7
ANN GRAS	2	0	0	0	0	0	0	0	0	0	0.2
ARIS BAS	3	3	2	1	1	3	2	4	4	0	2.3
ARIS CANOPY	27	15	7	6	7	10	10	12	21	8	12.3
SEMA BAS	1	1	1	0	0	0	0	0	0	0	0.3
SEMA CAN	3	2	2	0	0	0	0	0	0	0	0.7
CRCO	4	1	3	5	2	3	5	3	2	0	2.8
GUSA	1	1	1	1	3	5	1	1	0	0	1.4
SPSP	1	1	1	0	0	0	0	0	0	0	0.3
ERWR	2	2	1	1	1	0	0	0	0	0	0.7
SCBR BAS	1	0	0	0	0	0	0	0	0	0	0.1
SCBR CAN	2	1	0	0	0	0	0	0	0	0	0.3
ISTE	1	2	2	0	0	0	0	0	0	0	0.5
SOEL	1	0	0	0	0	0	0	0	0	0	0.1
ASTER	1	1	1	3	0	0	0	0	0	0	0.6
EVOL	2	1	0	0	0	0	0	0	0	0	0.3
SPFL BAS	0	0	0	0	0	0	0	0	0	0	0
SPFL CAN	1	0	0	0	0	0	0	0	0	0	0.1
MUPO BAS	0	0	0	0	0	0	0	0	0	0	0
MUPO CAN	1	1	4	0	0	0	0	0	0	0	0.6
BRDE	1	0	0	0	0	0	0	0	0	0	0.1
DECO	1	0	0	0	0	0	0	0	0	0	0.1
ZIGR	2	1	1	2	3	1	1	1	1	0	1.3

PLOT GW8
DATE 14-Oct-99

	1	2	3	4	5	6	7	8	9	10	MEAN
SOIL	51	41	40	47	38	35	37	47	48	43	42.7
ROCK	0	1	1	0	0	1	0	0	0	0	0.3
BARE	51	42	41	47	38	36	37	47	48	43	43
LITTER	12	13	9	7	5	10	15	15	9	7	10.2
PRGL	0	3	8	4	12	5	5	4	0	3	4.4
ANN FORB	17	25	29	33	22	18	25	23	18	37	24.7
ANN GRAS	1	2	0	1	2	2	0	0	1	2	1.1
ARIS BAS	3	2	0	0	3	1	2	0	1	1	1.3
ARIS CANOPY	15	12	5	3	16	14	6	7	13	6	9.7
SEMA BAS	0	1	0	0	1	1	0	1	0	0	0.4
SEMA CAN	1	2	1	3	1	5	0	1	0	0	1.4
CRCO	0	0	1	3	3	5	6	5	3	3	2.9
GUSA	2	4	1	1	3	0	2	1	2	0	1.6
SPSP	1	0	0	0	0	0	0	0	0	0	0.1
ERWR	0	1	0	1	1	1	1	0	0	0	0.5
SCBR BAS	0	0	0	0	0	0	0	0	0	0	0
SCBR CAN	0	0	0	0	0	0	0	0	0	0	0

ISTE	0	0	1	0	1	0	0	0	1	0	0.3
SOEL	1	0	0	0	0	0	0	0	0	0	0.1
ASTER	0	0	0	0	0	0	4	1	1	1	0.7
EVOL	0	0	0	0	0	0	0	0	0	0	0
SPFL BAS	0	0	0	0	0	0	0	0	0	0	0
SPFL CAN	0	0	0	0	0	0	0	0	0	0	0
MUPO BAS	1	0	0	0	0	0	0	0	0	0	0.1
MUPO CAN	1	0	0	0	0	0	0	0	0	0	0.1
BRDE	0	0	0	0	0	0	0	0	0	0	0
DECO	0	0	0	0	0	0	0	0	0	0	0
ZIGR	1	0	4	2	3	1	2	0	2	1	1.6

	1996	1999
SOIL		42.7
ROCK		0.3
BARE	52.9	43.0
LITTER	10.3	10.2
PRGL	17.1	4.4
ARIS CANOPY	12.3	9.7
ANN FORB	3.7	24.7
CRCO	2.8	2.9
ARIS BAS	2.3	1.3
GUSA	1.4	1.6
ZIGR	1.3	1.6
SEMA CAN	0.7	1.4
ERWR	0.7	0.5
ASTER	0.6	0.7
MUPO CAN	0.6	0.1
ISTE	0.5	0.3
SEMA BAS	0.3	0.4
SPSP	0.3	0.1
SCBR CAN	0.3	0
EVOL	0.3	0
ANN GRAS	0.2	1.1
SCBR BAS	0.1	0
SOEL	0.1	0.1
SPFL CAN	0.1	0
BRDE	0.1	0
DECO	0.1	0
SPFL BAS	0	0
MUPO BAS	0	0.1

PLOT	GW9 - Control										
DATE	9/19/96										
	1	2	3	4	5	6	7	8	9	10	MEAN
BARE	31	47	46	41	57	44	72	60	42	42	48.2
LITTER	8	5	8	8	10	10	21	16	12	7	10.5
PRGL	21	9	13	24	17	25	5	14	26	23	17.7
ANN FORB	1	7	4	5	7	5	5	5	14	11	6.4
BRDE	5	4	1	1	1	2	0	0	0	0	1.4
CRCO	4	2	1	3	3	2	3	2	2	2	2.4
ARIS BAS	3	3	1	3	1	4	2	2	3	0	2.2
ARIS CANOPY	11	10	6	9	7	11	11	17	12	4	9.8
ZIGR	2	1	1	4	2	1	1	0	0	0	1.2
SOEL	1	1	1	1	0	0	0	0	0	0	0.4
BOGR BAS	1	0	0	0	0	0	0	0	0	0	0.1
BOGR CAN	2	0	0	0	0	0	0	0	0	0	0.2
GUSA	1	1	1	1	1	1	0	0	0	0	0.6
ASTER	1	1	0	0	0	0	0	0	0	0	0.2
SPSP	1	1	0	0	0	0	0	0	0	0	0.2
MIBI	1	1	1	0	0	0	0	0	0	0	0.3
SCBR BAS	0	0	0	0	0	0	0	0	0	0	0
SCBR CAN	1	0	0	0	0	0	0	0	0	0	0.1
EVOL	1	1	1	1	0	0	0	0	0	0	0.4
BOCU BAS	1	1	0	0	0	0	0	0	0	0	0.2
BOCU CAN	3	2	1	0	0	0	0	0	0	0	0.6
MUPO BAS	0	0	0	0	0	0	0	0	0	0	0
MUPO CAN	2	1	1	0	0	0	0	0	0	0	0.4
MUAR BAS	0	0	0	0	0	0	0	0	0	0	0
MUAR CAN	1	0	0	0	0	0	0	0	0	0	0.1
ANN GRAS	1	1	2	1	1	1	0	0	0	0	0.7
ERLE BAS	0	0	0	0	0	0	0	0	0	0	0
ERLE CAN	1	0	0	0	0	0	0	0	0	0	0.1
ISTE	2	0	0	0	0	0	0	0	0	0	0.2
HIMU BAS	0	0	0	0	0	0	0	0	0	0	0
HIMU CAN	1	0	0	0	0	0	0	0	0	0	0.1
EPHEDRA	1	0	0	0	0	0	0	0	0	0	0.1
SEMA BAS	0	0	0	0	0	0	0	0	0	0	0
SEMA CAN	2	1	0	0	0	0	0	0	0	0	0.3
BOER BAS	1	0	0	0	0	0	0	0	0	0	0.1
BOER CAN	1	0	0	0	0	0	0	0	0	0	0.1
ERWR	1	1	0	0	0	0	0	0	0	0	0.2

PLOT	GW9										
DATE	14-Oct-99										
	1	2	3	4	5	6	7	8	9	10	MEAN
SOIL	37	36	47	26	23	31	43	38	34	21	33.6
ROCK	0	0	1	0	0	1	2	1	0	1	0.6
BARE	37	36	48	26	23	32	45	39	34	22	34.2
LITTER	14	18	9	12	14	13	12	7	12	14	12.5
PRGL	14	14	8	17	18	14	9	9	9	30	14.2
ANN FORB	10	8	11	9	8	13	9	9	7	7	9.1

BRDE	0	0	0	0	0	0	0	0	0	0	0
CRCO	3	3	0	0	2	0	1	2	1	1	1.3
ARIS BAS	2	2	2	6	2	3	2	0	3	1	2.3
ARIS CANOPY	17	17	15	21	22	26	17	27	32	15	20.9
ZIGR	2	2	2	2	3	1	1	4	2	2	2.1
SOEL	0	0	0	0	0	0	0	0	0	0	0
BOGR BAS	0	0	0	0	0	0	0	0	0	0	0
BOGR CAN	0	0	0	0	0	0	0	0	0	0	0
GUSA	3	3	1	2	1	3	1	6	1	1	2.2
ASTER	1	0	0	0	0	0	0	0	0	0	0.1
SPSP	1	0	0	0	0	0	0	0	0	0	0.1
MIBI	1	0	0	0	0	0	0	0	0	0	0.1
SCBR BAS	1	0	0	0	0	0	0	0	0	0	0.1
SCBR CAN	1	0	0	0	0	0	0	0	0	0	0.1
EVOL	1	1	0	0	0	0	0	0	0	0	0.2
BOCU BAS	0	0	0	0	0	0	0	0	0	1	0.1
BOCU CAN	0	0	0	4	2	0	0	3	2	0	1.1
MUPO BAS	0	0	0	0	0	0	0	0	0	0	0
MUPO CAN	0	0	0	0	0	0	0	0	0	0	0
MUAR BAS	0	0	0	0	0	0	0	0	0	0	0
MUAR CAN	0	0	0	0	0	0	0	0	0	0	0
ANN GRAS	2	0	2	12	4	1	4	1	7	10	4.3
ERLE BAS	0	0	0	0	0	0	0	0	0	0	0
ERLE CAN	0	0	0	0	0	0	0	0	0	0	0
ISTE	1	0	0	0	0	0	0	0	0	0	0.1
HIMU BAS	0	0	0	0	0	0	0	0	0	0	0
HIMU CAN	0	0	0	0	0	0	0	0	0	0	0
EPHEDRA	1	0	0	0	0	0	0	0	0	0	0.1
SEMA BAS	0	0	0	1	1	0	0	0	1	1	0.4
SEMA CAN	1	0	0	3	1	0	0	1	2	6	1.4
BOER BAS	0	0	0	0	0	0	0	0	0	0	0
BOER CAN	1	0	0	0	0	0	0	0	0	0	0.1
ERWR	2	2	3	0	4	1	1	1	1	0	1.5

	1996	1999
SOIL		33.6
ROCK		0.6
BARE	48.2	34.2
PRGL	17.7	14.2
LITTER	10.5	12.5
ARIS CANOPY	9.8	20.9
ANN FORB	6.4	9.1
CRCO	2.4	1.3
ARIS BAS	2.2	2.3
BRDE	1.4	0
ZIGR	1.2	2.1
ANN GRAS	0.7	4.3
GUSA	0.6	2.2
BOCU CAN	0.6	1.1
SOEL	0.4	0

EVOL	0.4	0.2
MUPO CAN	0.4	0
MIBI	0.3	0.1
SEMA CAN	0.3	1.4
BOGR CAN	0.2	0
ASTER	0.2	0.1
SPSP	0.2	0.1
BOCU BAS	0.2	0.1
ISTE	0.2	0.1
ERWR	0.2	1.5
BOGR BAS	0.1	0
SCBR CAN	0.1	0.1
MUAR CAN	0.1	0
ERLE CAN	0.1	0
HIMU CAN	0.1	0
EPHEDRA	0.1	0.1
BOER BAS	0.1	0
BOER CAN	0.1	0.1
SCBR BAS	0	0.1
MUPO BAS	0	0
MUAR BAS	0	0
ERLE BAS	0	0
HIMU BAS	0	0
SEMA BAS	0	0.4

PLOT GW10 Crush / Seed (No summary)
DATE 9/20/96

	1	2	3	4	5	6	7	8	9	10	MEAN
BARE	44	50	62	48	62	57	44	68	58	60	55.3
LITTER	14	9	10	15	16	12	8	18	18	14	13.4
PRGL	30	27	16	19	22	24	24	17	24	27	23
ANN FORB	4	3	1	6	1	1	1	3	0	0	2
CRCO	3	2	2	4	2	1	3	1	3	1	2.2
ARIS BAS	1	1	2	2	1	1	1	1	0	0	1
ARIS CANOPY	6	3	3	7	9	2	6	2	6	0	4.4
EVOL	1	0	0	0	0	0	0	0	0	0	0.1
PAOB BAS	1	0	0	0	0	0	0	0	0	0	0.1
PAOB CAN	2	0	0	0	0	0	0	0	0	0	0.2
ZIGR	1	1	1	0	0	0	0	0	0	0	0.3
BRDE	1	0	0	0	0	0	0	0	0	0	0.1
ANN GRAS	4	1	2	0	0	0	0	0	0	0	0.7
ERWR	1	1	0	0	0	0	0	0	0	0	0.2
SPWR BAS	1	0	0	0	0	0	0	0	0	0	0.1
SPWR CAN	2	0	0	0	0	0	0	0	0	0	0.2
MUAR BAS	0	0	0	0	0	0	0	0	0	0	0
MUAR CAN	1	0	0	0	0	0	0	0	0	0	0.1
ISTE	1	0	0	0	0	0	0	0	0	0	0.1
GUSA	1	0	0	0	0	0	0	0	0	0	0.1
SEMA BAS	0	0	0	0	0	0	0	0	0	0	0
SEMA CAN	3	0	0	0	0	0	0	0	0	0	0.3
SPFL CAN	1	0	0	0	0	0	0	0	0	0	0.1
SOEL	1	0	0	0	0	0	0	0	0	0	0.1
BOCU CAN	1	0	0	0	0	0	0	0	0	0	0.1
DICA CAN	1	0	0	0	0	0	0	0	0	0	0.1

PLOT GW10
DATE 14-Oct-99

	1	2	3	4	5	6	7	8	9	10	MEAN
SOIL	27	37	42	50	52	36	35	53	58	44	43.4
ROCK	1	0	0	0	0	1	0	0	0	0	0.2
BARE	28	0	0	0	0	37	0	0	0	0	6.5
LITTER	14	12	9	9	8	7	7	6	11	10	9.3
PRGL	13	6	10	2	3	2	3	5	2	2	4.8
ANN FORB	14	14	18	27	16	18	13	19	17	12	16.8
CRCO	3	4	2	2	1	2	6	1	1	2	2.4
ARIS BAS	3	3	1	0	0	1	3	0	0	1	1.2
ARIS CANOPY	6	17	6	1	3	19	17	3	2	9	8.3
EVOL	1	0	0	0	0	0	0	0	0	0	0.1
PAOB BAS	1	0	0	0	0	0	0	0	0	0	0.1
PAOB CAN	2	0	0	0	0	0	0	0	0	0	0.2
ZIGR	1	0	0	0	0	3	3	3	1	0	1.1
BRDE	0	0	0	0	0	0	0	0	0	0	0
ANN GRAS	5	4	1	1	3	8	3	6	2	10	4.3
ERWR	0	0	0	0	0	0	0	0	0	0	0
SPWR BAS	0	0	0	0	0	0	0	0	0	0	0

SPWR CAN	0	0	0	0	0	0	0	0	0	0	0
MUAR BAS	0	0	0	0	0	0	0	0	0	0	0
MUAR CAN	0	0	0	0	0	0	0	0	0	0	0
ISTE	0	0	0	0	0	0	0	0	0	0	0
GUSA	1	0	0	0	0	0	0	0	0	0	0.1
SEMA BAS	2	0	1	2	2	0	3	0	0	0	1
SEMA CAN	12	5	5	5	9	3	8	6	5	7	6.5
SPFL CAN	0	0	0	0	0	0	0	0	0	0	0
SOEL	0	0	0	0	0	0	0	0	0	0	0
BOCU CAN	1	2	0	0	0	0	0	0	0	0	0.3
DICA CAN	1	1	1	0	0	0	0	0	0	0	0.3

PLOT	GW11	Crush								
DATE	9/20/96									
	1	2	3	4	5	6	7	8	9	10	MEAN
BARE	73	74	80	64	71	44	48	80	73	54	66.1
LITTER	2	8	8	18	15	17	7	9	2	4	9
PRGL	9	11	5	11	9	11	4	6	5	9	8
ANN FORB	2	4	2	2	8	2	0	0	0	0	2
ANN GRAS	3	1	2	0	0	0	0	0	0	0	0.6
TAAU	1	1	1	2	0	0	0	0	0	0	0.5
SCBR BAS	1	2	1	2	2	4	0	0	0	0	1.2
SCBR CAN	2	3	3	3	7	4	0	0	0	0	2.2
ARIS BAS	1	1	3	0	0	0	0	0	0	0	0.5
ARIS CAN	3	3	4	8	4	2	2	2	0	0	2.8
BOGR BAS	1	2	1	1	0	0	0	0	0	0	0.5
BOGR CAN	2	3	1	1	0	0	0	0	0	0	0.7
GUSA	1	1	1	1	0	0	0	0	0	0	0.4
PAOB BAS	1	1	2	0	0	0	0	0	0	0	0.4
PAOB CAN	3	3	7	7	1	2	4	0	0	0	2.7
MUAR BAS	1	1	1	2	0	0	0	0	0	0	0.5
MUAR CAN	4	3	2	2	0	0	0	0	0	0	1.1
BOER BAS	1	0	0	0	0	0	0	0	0	0	0.1
BOER CAN	3	2	0	0	0	0	0	0	0	0	0.5
EVOL	1	1	3	3	0	0	0	0	0	0	0.8
CRCO	2	2	4	2	4	3	2	6	0	0	2.5
SEMA BAS	0	0	0	0	0	0	0	0	0	0	0
SEMA CAN	1	0	0	0	0	0	0	0	0	0	0.1
ZIGR	1	1	0	0	0	0	0	0	0	0	0.2
EPHEDRA	1	0	0	0	0	0	0	0	0	0	0.1
SILE	1	1	0	0	0	0	0	0	0	0	0.2
ASTER	1		0	0	0	0	0	0	0	0	0.1
HODE	3	1	1	0	0	0	0	0	0	0	0.5
SOEL	1	0	0	0	0	0	0	0	0	0	0.1

PLOT	GW11									
DATE	15-Oct-99									
	1	2	3	4	5	6	7	8	9	10	MEAN
SOIL	62	62	63	61	42	49	57	52	47	43	53.8
ROCK	1	0	0	0	0	1	2	0	1	0	0.5
BARE	63	62	63	61	42	50	59	52	48	43	54.3
LITTER	3	3	4	2	5	10	3	7	10	5	5.2
PRGL	0	2	1	3	1	2	3	5	2	1	2
ANN FORB	22	26	19	20	24	26	15	26	16	19	21.3
ANN GRAS	2	1	1	1	0	3	9	0	2	2	2.1
TAAU	0	0	0	0	0	0	0	0	0	0	0
SCBR BAS	0	0	0	0	1	0	0	0	1	0	0.2
SCBR CAN	0	0	1	0	5	0	1	1	2	1	1.1
ARIS BAS	0	0	0	0	2	0	0	0	0	3	0.5
ARIS CAN	0	1	0	4	10	0	3	2	11	16	4.7
BOGR BAS	1	0	0	0	0	0	0	0	0	0	0.1
BOGR CAN	1	0	0	0	0	0	0	0	0	0	0.1

GUSA	0	0	2	0	0	1	1	0	0	1	0.5
PAOB BAS	0	0	1	0	0	0	0	0	1	2	0.4
PAOB CAN	0	0	3	10	1	0	0	4	7	11	3.6
MUAR BAS	0	0	0	0	0	0	0	0	0	0	0
MUAR CAN	1	2	0	0	0	0	0	0	0	0	0.3
BOER BAS	0	1	0	0	1	0	0	0	0	0	0.2222
BOER CAN	0	1	0	0	5	0	0	0	0	0	0.6667
EVOL	0	0	0	0	0	0	0	0	0	0	0
CRCO	3	4	2	1	3	1	0	1	3	0	1.8
SEMA BAS	0	0	0	0	0	1	0	1	0	0	0.2
SEMA CAN	0	0	1	0	0	4	2	2	1	0	1
ZIGR	1	0	0	0	2	0	1	0	1	0	0.5
EPHEDRA	0	0	0	0	0	0	0	0	0	0	0
SILE	1	1	1	1	0	0	0	0	0	0	0.4
ASTER	0	0	0	0	0	0	0	0	0	0	0
HODE	1	3	1	0	0	0	0	0	0	0	0.5
SOEL	1	0	0	0	0	0	0	0	0	0	0.1

	1996	1999
SOIL		53.8
ROCK		0.5
BARE	66.1	54.3
LITTER	9.0	5.2
PRGL	8.0	2.0
ARIS CAN	2.8	4.7
PAOB CAN	2.7	3.6
CRCO	2.5	1.8
SCBR CAN	2.2	1.1
ANN FORB	2.0	21.3
SCBR BAS	1.2	0.2
MUAR CAN	1.1	0.3
EVOL	0.8	0.0
BOGR CAN	0.7	0.1
ANN GRAS	0.6	2.1
TAAU	0.5	0.0
ARIS BAS	0.5	0.5
BOGR BAS	0.5	0.1
MUAR BAS	0.5	0.0
BOER CAN	0.5	0.7
HODE	0.5	0.5
GUSA	0.4	0.5
PAOB BAS	0.4	0.4
ZIGR	0.2	0.5
SILE	0.2	0.4
ASTER	0.1	0.0
BOER BAS	0.1	0.2
SEMA CAN	0.1	1.0
EPHEDRA	0.1	0.0
SOEL	0.1	0.1
SEMA BAS	0.0	0.2

PLOT	GW12 – Crush & Seed									
DATE	9/20/96									
	1	2	3	4	5	6	7	8	9	10
BARE	51	54	67	55	61	55	86	65	67	74
LITTER	8	14	10	27	16	16	6	8	6	6
PRGL	9	8	2	6	10	7	2	8	5	0
ANN FORB	2	1	1	1	1	1	1	1	1	0
ARIS BAS	3	1	1	2	1	1	3	1	0	0
ARIS CAN	6	4	7	7	5	5	15	13	4	3
BOER BAS	2	2	2	1	1	0	0	0	0	0
BOER CAN	3	3	4	3	2	1	0	0	0	0
CRCO	5	7	3	1	3	4	4	5	3	4
MUAR BAS	1	2	0	0	0	0	0	0	0	0
MUAR CAN	3	3	1	3	0	0	0	0	0	0
PAOB BAS	1	1	1	1	1	0	0	0	0	0
PAOB CAN	2	3	4	5	2	2	1	4	2	4
SCBR BAS	6	3	0	0	0	0	0	0	0	0
SCBR CAN	7	4	1	0	0	0	0	0	0	0
ZIGR	1	1	1	1	0	0	0	0	0	0
ISTE	1	1	1	1	0	0	0	0	0	0
TAAU	1	0	0	0	0	0	0	0	0	0
EVOL	1	1	1	2	2	0	0	0	0	0
HIMU BAS	1	0	0	0	0	0	0	0	0	0
HIMU CAN	1	0	0	0	0	0	0	0	0	0
GUSA	1	1	0	0	0	0	0	0	0	0
ERLE BAS	1	0	0	0	0	0	0	0	0	0
ERLE CAN	1	0	0	0	0	0	0	0	0	0
SOEL	1	0	0	0	0	0	0	0	0	0
MUPO CAN	1	0	0	0	0	0	0	0	0	0
SILE	1	0	0	0	0	0	0	0	0	0
ASTER	1	0	0	0	0	0	0	0	0	0
ANN GRAS	1	0	0	0	0	0	0	0	0	0

PLOT	GW12									
DATE	15-Oct-99									
	1	2	3	4	5	6	7	8	9	10
SOIL	37	55	48	53	51	34	41	55	39	45
ROCK	1	0	0	2	0	0	0	0	0	0
BARE	38	0	0	55	0	0	0	0	0	0
LITTER	5	7	4	4	6	11	9	8	7	11
PRGL	9	3	2	3	1	1	1	1	7	1
ANN FORB	10	14	10	13	16	10	14	9	16	14
ARIS BAS	1	1	3	0	1	2	3	1	0	0
ARIS CAN	6	5	8	5	10	21	17	15	7	6
BOER BAS	2	0	0	0	0	0	0	0	0	0
BOER CAN	3	1	1	0	1	0	1	2	0	0
CRCO	6	6	6	1	3	8	4	3	5	0
MUAR BAS	0	0	0	0	0	0	1	0	0	0
MUAR CAN	0	0	1	0	0	2	3	1	2	0
PAOB BAS	2	1	2	4	0	1	1	0	1	5

PAOB CAN	15	3	14	12	7	7	6	2	13	19
SCBR BAS	1	0	0	0	0	0	1	1	0	0
SCBR CAN	3	3	0	0	0	3	2	1	0	0
ZIGR	1	2	2	1	0	0	0	1	2	1
ISTE	1	0	0	0	0	0	0	0	0	0
TAAU	0	0	0	0	0	0	0	0	0	0
EVOL	0	0	0	1	1	1	1	0	2	3
HIMU BAS	2	0	0	0	0	0	0	0	0	0
HIMU CAN	3	0	0	0	0	0	0	0	0	0
GUSA	1	0	0	0	0	0	0	0	0	0
ERLE BAS	0	0	0	0	0	0	0	0	0	0
ERLE CAN	0	0	0	0	0	0	0	0	0	0
SOEL	1	0	0	0	0	0	0	0	0	0
MUPO CAN	0	0	0	0	0	0	0	0	0	0
SILE	1	0	0	0	0	0	0	0	0	0
ASTER	1	0	2	0	2	1	2	0	0	1
ANN GRAS	1	3	1	1	0	0	0	0	0	0

	1996	1999	
SOIL		45.8	
ROCK		0.3	
BARE	63.5	9.3	-
LITTER	11.7	7.2	-
PRGL	5.7	2.9	-
ARIS CAN - three awn	6.9	10	+
CRCO - pygmyweed	3.9	4.2	+
PAOB CAN - panicgrass	2.9	9.8	+
BOER CAN - bluets	1.6	0.9	-
ARIS BAS - three awn	1.3	1.2	
SCBR CAN - burreagrass	1.2	1.2	
ANN FORB	1.0	12.6	+
MUAR CAN	1.0	0.9	
SCBR BAS - burreagrass	0.9	0.3	-
BOER BAS - bluets	0.8	0.2	-
EVOL	0.7	0.9	
PAOB BAS - panic grass	0.5	1.7	+
ZIGR - zinnia	0.4	1.0	+
ISTE	0.4	0.1	
MUAR BAS	0.3	0.1	
GUSA - snakeweed	0.2	0.1	-
TAAU	0.1	0	
HIMU BAS - tobosagrass	0.1	0.2	+
HIMU CAN - tobosagrass	0.1	0.3	
ERLE BAS - Lehmann	0.1	0	
ERLE CAN - Lehmann	0.1	0	
SOEL	0.1	0.1	
MUPO CAN - bush muhly	0.1	0	
SILE	0.1	0.1	
ASTER	0.1	0.9	+
ANN GRAS	0.1	0.6	+

mean
63.5
11.7
5.7
1.0
1.3
6.9
0.8
1.6
3.9
0.3
1.0
0.5
2.9
0.9
1.2
0.4
0.4
0.1
0.7
0.1
0.1
0.2
0.1
0.1
0.1
0.1
0.1
0.1
0.1

mean
45.8
0.3
9.3
7.2
2.9
12.6
1.2
10.0
0.2
0.9
4.2
0.1
0.9
1.7

PLOT MD1
DATE Oct 17, 1996

	1	2	3	4	5	6	7	8	9	10	mean
BARE	78	88	82	80	60	91	93	73	87	81	81.3
LITTER	7	3	6	5	12	1	3	5	9	6	5.7
ANN FORB	0	0	1	0	0	0	0	0	0	0	0.1
PRGL	12	7	8	15	23	7	4	21	5	9	11.1
ANN GRAS	0	0	1	0	0	0	0	0	0	0	0.1
GUSA	2	2	0	1	5	2	0	0	0	1	1.3
XMAS	1	0	0	0	0	0	0	0	0	0	0.1
MUPO BAS	0	0	0	0	0	0	0	0	0	0	0.0
MUPO CAN	1	1	0	0	0	0	0	0	0	0	0.2
HIMU BAS	0	0	2	0	0	0	0	0	0	0	0.2
HIMU CAN	0	0	3	0	1	0	0	0	0	0	0.4
PPEAR	0	0	0	0	0	1	0	0	0	0	0.1
4WING	0	0	0	0	1	0	1	0	0	0	0.2

PLOT MD1
DATE 7-Oct-99

	1	2	3	4	5	6	7	8	9	10	mean
SOIL	43	49	53	56	48	42	55	48	65	57	51.6
ROCK	0	0	2	5	3	0	1	2	1	7	2.1
BARE	43	49	55	61	51	42	56	50	66	64	53.7
LITTER	46	41	37	36	42	41	34	26	25	28	35.6
ANN FORB	0	0	0	1	1	1	5	5	0	0	1.3
PRGL	6	8	3	1	4	12	4	7	11	5	6.1
ANN GRAS	0	0	1	0	0	0	0	0	0	0	0.1
GUSA	2	0	0	0	0	0	2	0	0	0	0.4
XMAS	0	0	0	0	0	0	0	0	0	0	0.0
MUPO BAS	0	0	0	0	0	0	0	0	0	0	0.0
MUPO CAN	1	0	0	0	0	0	0	0	0	0	0.1
HIMU BAS	0	0	0	0	0	0	0	0	0	0	0.0
HIMU CAN	1	1	0	0	0	0	0	0	0	0	0.2
PPEAR	1	5	0	0	0	0	0	0	0	0	0.6
4WING	1	0	3	2	0	3	0	2	0	0	1.1

	1996	1999
SOIL		51.6
ROCK		2.1
BARE	81.3	53.7
LITTER	5.7	35.6
ANN FORB	0.1	1.3
PRGL	11.1	6.1
ANN GRAS	0.1	0.1
GUSA	1.3	0.4
XMAS	0.1	0
MUPO BAS	0	0
MUPO CAN	0.2	0.1
HIMU BAS	0.2	0
HIMU CAN	0.4	0.2
PPEAR	0.1	0.6
4WING	0.2	1.1

S.E.
3.1
1.0
0.1
2.1
0.1
0.5
0.1
0.0
0.1
0.2
0.3
0.1
0.1

S.E.
2.2
0.7
2.6
2.3
0.6
1.1
0.1
0.3
0.0
0.0
0.1
0.0
0.1
0.5
0.4

PLOT MD 2
DATE Oct 17, 1996

	1	2	3	4	5	6	7	8	9	10	mean	S.E.
BARE	83	77	74	76	78	78	72	77	72	67	75.4	1.4
LITTER	3	9	1	6	4	7	9	3	6	4	5.2	0.8
ANN FORB	0	0	0	0	1	0	1	0	0	1	0.3	0.2
PRGL	12	11	11	17	9	12	16	17	18	13	13.6	1.0
ANN GRAS	0	1	10	0	5	0	0	0	2	6	2.4	1.1
GUSA	0	2	5	0	3	1	2	0	0	6	1.9	0.7
SPWR BAS	1	0	0	0	0	2	0	0	1	0	0.4	0.2
SPWR CAN	4	0	0	0	0	2	0	3	1	0	1.0	0.5
SEMA BAS	0	0	0	0	0	0	0	0	0	0	0.0	0.0
SEMA CAN	0	2	1	0	0	0	0	0	0	1	0.4	0.2
MUPO BAS	0	0	0	0	0	0	0	0	0	0	0.0	0.0
MUPO CAN	0	0	1	0	2	0	1	0	0	3	0.7	0.3
MIBI	0	0	0	0	0	0	0	0	0	1	0.1	0.1
TARBUSH	0	0	0	0	0	0	0	0	0	1	0.1	0.1

PLOT MD 2
DATE 11-Oct-99

	1	2	3	4	5	6	7	8	9	10	mean	S.E.
SOIL	58	57	50	53	51	59	64	50	63	44	54.9	2.0
ROCK	3	4	9	3	10	5	6	6	9	8	6.3	0.8
BARE	61	61	59	56	61	64	70	56	72	52	61.2	2.0
LITTER	19	26	25	15	15	28	17	26	10	23	20.4	1.9
ANN FORB	2	0	0	2	4	0	0	0	2	3	1.3	0.5
PRGL	13	10	12	22	11	9	8	16	10	10	12.1	1.3
ANN GRAS	0	0	1	2	5	0	2	2	10	12	3.4	1.4
GUSA	0	1	1	1	0	0	2	1	1	1	0.8	0.2
SPWR BAS	0	0	0	0	0	0	0	0	0	0	0.0	0.0
SPWR CAN	2	3	1	2	1	3	1	1	2	0	1.6	0.3
SEMA BAS	0	0	0	0	0	0	0	0	0	0	0.0	0.0
SEMA CAN	0	0	0	2	2	0	0	2	1	1	0.8	0.3
MUPO BAS	0	0	0	0	0	0	0	0	0	0	0.0	0.0
MUPO CAN	0	0	0	0	0	0	0	0	0	2	0.2	0.2
MIBI	0	0	0	0	0	0	0	0	0	1	0.1	0.1
TARBUSH	0	0	0	0	0	0	0	0	0	0	0.0	0.0

	1996	1999
SOIL		54.9
ROCK		6.3
BARE	75.4	61.2
LITTER	5.2	20.4
ANN FORB	0.3	1.3
PRGL	13.6	12.1
ANN GRAS	2.4	3.4
GUSA	1.9	0.8
SPWR BAS	0.4	0
SPWR CAN	1.0	1.6
SEMA BAS	0.0	0
SEMA CAN	0.4	0.8
MUPO BAS	0.0	0
MUPO CAN	0.7	0.2
MIBI	0.1	0.1
TARBUSH	0.1	0

PLOT MD 3
DATE Oct 17, 1996

	1	2	3	4	5	6	7	8	9	10	mean
BARE	75	65	64	70	70	67	76	63	73	75	69.8
LITTER	10	17	19	1	10	6	6	15	6	5	9.5
PRGL	9	8	6	13	15	18	17	13	18	13	13.0
ANN FORB	0	0	0	0	0	0	0	0	0	0	0
ANN GRAS	5	0	0	16	0	0	0	0	0	0	2.1
SPWR BAS	1	0	2	0	0	1	0	1	0	0	0.5
SPWR CAN	1	1	2	0	0	3	0	3	0	0	1.0
GUSA	0	7	7	4	4	8	2	2	0	3	3.7
PPEAR	0	1	0	0	0	0	0	0	0	0	0.1
HIMU BAS	0	1	0	0	0	1	0	0	0	0	0.2
HIMU CAN	0	1	0	0	0	1	0	0	1	0	0.3
MUPO BAS	0	0	0	0	0	0	0	0	0	0	0.0
MUPO CAN	0	0	1	0	1	0	1	0	0	1	0.4
4WING	0	0	1	0	0	0	0	0	0	0	0.1
ZIZYPHUS	0	0	0	0	0	0	0	0	0	1	0.1
CONDALIA	0	0	0	0	0	0	0	0	3	3	0.6
SEMA BAS	0	0	0	0	0	0	0	0	0	0	0.0
SEMA CAN	0	0	0	0	0	0	1	0	0	0	0.1
PAOB BAS	0	0	0	0	0	0	0	0	0	1	0.1
PAOB CAN	0	0	0	0	0	0	0	0	0	2	0.2

PLOT MD 3
DATE 11-Oct-99

	1	2	3	4	5	6	7	8	9	10	mean
SOIL	54	56	60	47	64	60	59	64	61	65	59.0
ROCK	0	5	6	2	3	1	8	3	2	6	3.6
BARE	54	61	66	49	67	61	67	67	63	71	62.6
LITTER	14	25	18	27	10	16	11	13	15	17	16.6
PRGL	2	5	4	11	7	4	4	11	9	2	5.9
ANN FORB	5	0	0	2	2	5	2	2	2	0	2.0
ANN GRAS	10	1	2	2	7	11	12	0	2	4	5.1
SPWR BAS	0	0	0	0	0	0	0	0	0	0	0.9
SPWR CAN	0	1	0	3	0	2	0	0	0	3	3.3
GUSA	1	4	7	8	3	2	0	4	0	4	3.3
PPEAR	3	1	0	0	0	0	0	0	0	0	0.4
HIMU BAS	0	0	0	0	0	0	0	0	0	0	0.0
HIMU CAN	0	0	1	0	1	0	1	0	0	0	0.3
MUPO BAS	0	0	0	0	0	0	0	0	0	0	0.0
MUPO CAN	1	3	0	0	0	0	0	0	0	0	0.4
4WING	3	1	0	0	0	0	0	0	0	0	0.4
ZIZYPHUS	0	0	0	0	0	0	0	0	0	0	0.0
CONDALIA	3	0	0	0	0	0	0	0	0	0	0.3
SEMA BAS	0	0	0	0	0	0	0	0	0	0	0.0
SEMA CAN	2	1	1	0	0	0	0	0	0	0	0.4
PAOB BAS	0	0	0	0	0	0	0	0	0	0	0.0
PAOB CAN	2	1	0	0	0	0	0	0	0	0	0.3

PLOT MD3

	1996	1999
SOIL		59.0
ROCK		3.6
BARE	69.8	62.6
LITTER	9.5	16.6
PRGL	13.0	5.9
ANN FORB	0.0	2.0
ANN GRAS	2.1	5.1
SPWR BAS	0.5	0.9
SPWR CAN	1.0	3.3
GUSA	3.7	3.3
PPEAR	0.1	0.4
HIMU BAS	0.2	0.0
HIMU CAN	0.3	0.3
MUPO BAS	0.0	0.0
MUPO CAN	0.4	0.4
4WING	0.1	0.4
ZIZYPHUS	0.1	0.0
CONDALIA	0.6	0.3
SEMA BAS	0.0	0.0
SEMA CAN	0.1	0.4
PAOB BAS	0.1	0.0
PAOB CAN	0.2	0.3

S.E.
1.5
1.8
1.3
0.0
1.6
0.2
0.4
0.9
0.1
0.1
0.2
0.0
0.2
0.1
0.1
0.4
0.0
0.1
0.1
0.2

S.E.
1.7
0.8
2.1
1.8
1.1
0.6
1.4
0.0
0.4
0.9
0.3
0.0
0.2
0.0
0.3
0.3
0.0
0.3
0.0
0.2
0.0
0.2

PLOT MD 4
DATE Oct 18, 1996

	1	2	3	4	5	6	7	8	9	10	mean	S.E.
BARE	53	51	47	64	61	67	56	41	52	50	54.2	2.5
LITTER	11	11	23	7	14	15	12	25	21	21	16.0	1.9
ANN FORB	0	2	0	1	0	0	0	0	1	0	0.4	0.2
PRGL	28	18	21	15	15	5	17	18	12	18	16.7	1.9
ANN GRAS	1	7	1	2	0	2	3	1	0	3	2.0	0.7
GUSA	3	6	6	4	7	5	7	14	10	4	6.6	1.0
MUPO BAS	1	0	0	0	0	0	0	0	0	0	0.1	0.1
MUPO CAN	5	1	1	4	0	3	3	1	5	0	2.3	0.6
HIMU BAS	0	0	0	0	0	0	0	1	0	0	0.1	0.1
HIMU CAN	1	1	0	0	0	0	0	1	0	0	0.3	0.2
PAOB BAS	0	0	0	0	0	0	0	0	0	0	0.0	0.0
PAOB CAN	1	0	0	2	0	0	5	0	0	0	0.8	0.5
CELTIS	0	0	1	0	0	0	0	3	0	0	0.4	0.3
SPFL BAS	0	0	0	1	0	0	0	0	0	0	0.1	0.1
SPFL CAN	0	1	0	1	0	0	0	0	0	0	0.2	0.1
CONDALIA	0	1	0	3	0	0	0	0	0	0	0.4	0.3
SEMA BAS	0	0	0	0	0	0	0	0	0	0	0.0	0.0
SEMA CAN	0	1	0	1	1	2	0	0	1	0	0.6	0.2
BOCU BAS	0	0	0	0	0	1	0	0	0	0	0.1	0.1
BOCU CAN	0	1	0	0	1	1	1	0	1	0	0.5	0.2
ISTE	0	0	1	0	0	1	0	0	0	0	0.2	0.1
ZIZYPHUS	0	0	0	0	0	0	0	0	0	1	0.1	0.1
ARIS BAS	0	0	0	0	0	0	0	0	0	0	0.0	0.0
ARIS CAN	0	0	0	0	0	0	0	0	0	3	0.3	0.3
RHMI	0	0	0	0	0	0	0	1	0	0	0.1	0.1
SOEL	0	0	0	0	1	0	0	0	0	0	0.1	0.1

PLOT MD 4
DATE 11-Oct-99

	1	2	3	4	5	6	7	8	9	10	mean	S.E.
SOIL	44	40	50	48	46	50	52	48	51	66	49.5	2.2
ROCK	14	6	3	0	6	3	5	3	1	5	4.6	1.2
BARE	58	46	53	48	52	53	57	51	52	71	54.1	2.2
LITTER	9	10	13	13	5	19	11	19	14	12	12.5	1.4
ANN FORB	3	4	0	6	1	0	1	1	0	1	1.7	0.6
PRGL	18	28	20	26	27	19	18	22	18	5	20.1	2.1
ANN GRAS	3	1	0	1	1	0	3	0	3	2	1.4	0.4
GUSA	10	7	11	9	9	3	9	10	7	4	7.9	0.8
MUPO BAS	0	0	0	0	0	0	0	0	0	0	0.0	0.0
MUPO CAN	1	4	0	2	0	4	0	2	1	0	1.4	0.5
HIMU BAS	0	0	0	0	0	0	0	0	0	0	0.0	0.0
HIMU CAN	1	1	0	0	0	0	0	0	0	0	0.2	0.1
PAOB BAS	0	0	0	0	0	0	0	0	0	0	0.0	0.0
PAOB CAN	4	3	2	1	0	0	0	0	0	4	1.4	0.5
CELTIS	3	0	0	0	0	0	0	0	0	0	0.3	0.3
SPFL BAS	0	0	0	0	0	0	0	0	0	0	0.0	0.0
SPFL CAN	1	1	4	1	0	0	0	0	0	0	0.7	0.4
CONDALIA	2	0	0	0	0	0	0	0	0	0	0.2	0.2
SEMA BAS	0	0	0	0	0	0	0	0	0	0	0.0	0.0
SEMA CAN	1	2	1	2	0	0	1	0	1	0	0.8	0.2
BOCU BAS	0	0	0	0	0	0	0	0	0	0	0.0	0.0
BOCU CAN	1	0	0	0	0	0	0	0	0	0	0.1	0.1
ISTE	2	2	0	0	0	0	0	0	0	0	0.4	0.3
ZIZYPHUS	0	0	0	0	0	0	0	0	0	0	0.0	0.0
ARIS BAS	0	0	0	0	0	0	0	0	0	0	0.0	0.0
ARIS CAN	1	4	0	0	0	0	0	0	0	0	0.5	0.4
RHMI	0	0	0	0	0	0	0	0	0	0	0.0	0.0
SOEL	1	1	0	0	0	0	0	0	0	0	0.2	0.1

PLOT MD4

	1996	1999
SOIL		49.5
ROCK		4.6
BARE	54.2	54.1
LITTER	16	12.5
ANN FORB	0.4	1.7
PRGL	16.7	20.1
ANN GRAS	2.0	1.4
GUSA	6.6	7.9
MUPO BAS	0.1	0
MUPO CAN	2.3	1.4
HIMU BAS	0.1	0
HIMU CAN	0.3	0.2
PAOB BAS	0	0
PAOB CAN	0.8	1.4
CELTIS	0.4	0.3
SPFL BAS	0.1	0
SPFL CAN	0.2	0.7
CONDALIA	0.4	0.2
SEMA BAS	0	0
SEMA CAN	0.6	0.8
BOCU BAS	0.1	0
BOCU CAN	0.5	0.1
ISTE	0.2	0.4
ZIZYPHUS	0.1	0
ARIS BAS	0	0
ARIS CAN	0.3	0.5
RHMI	0.1	0
SOEL	0.1	0.2

PLOT MD 5
DATE Oct 18, 1996

	1	2	3	4	5	6	7	8	9	10	mean	S.E.
BARE	76	79	68	71	66	59	56	70	67	61	67.3	2.3
LITTER	7	8	10	11	8	14	15	14	8	13	10.8	1.0
ANN FORB	0	0	0	0	0	0	1	0	0	0	0.1	0.1
PRGL	13	7	14	14	15	22	18	8	21	13	14.5	1.5
4WING	1	1	1	0	1	0	0	0	0	0	0.4	0.2
GUSA	3	3	2	3	3	5	7	4	3	9	4.2	0.7
OPSPI	0	1	0	1	0	0	0	0	0	0	0.2	0.1
MUPO BAS	0	0	0	0	1	0	0	0	0	0	0.1	0.1
MUPO CAN	0	0	2	2	8	0	2	1	3	3	2.1	0.8
HIMU BAS	0	0	0	0	0	0	1	1	0	0	0.2	0.1
HIMU CAN	0	0	1	0	0	0	3	2	0	0	0.6	0.3
SPWR BAS	0	0	2	0	0	0	0	0	0	0	0.2	0.2
SPWR CAN	0	0	4	0	0	0	0	1	0	0	0.5	0.4
SEMA BAS	0	0	0	0	0	0	0	0	0	0	0.0	0.0
SEMA CAN	0	0	1	0	0	0	0	0	0	0	0.1	0.1
PPEAR	0	0	1	0	0	0	0	1	1	2	0.5	0.2
PAOB BAS	0	0	0	0	0	0	0	0	0	0	0.0	0.0
PAOB CAN	0	0	0	0	0	0	0	0	1	0	0.1	0.1
BOCU BAS	0	0	0	0	0	0	0	0	0	1	0.1	0.1
BOCU CAN	0	0	0	0	0	0	0	0	0	1	0.1	0.1

PLOT MD 5 UNTREATED
DATE 11-Oct-99

	1	2	3	4	5	6	7	8	9	10	mean	S.E.
SOIL	81	71	63	60	66	50	63	53	45	51	60.3	3.5
ROCK	8	6	2	2	8	4	5	1	3	3	4.2	0.8
BARE	89	77	65	62	74	54	68	54	48	54	64.5	4.0
LITTER	6	8	6	8	9	9	11	18	15	9	9.9	1.2
ANN FORB	1	0	0	0	0	0	0	0	0	0	0.1	0.1
PRGL	8	9	10	24	10	26	18	18	22	23	16.8	2.2
4WING	0	1	0	1	0	1	1	0	1	1	0.6	0.2
GUSA	5	6	5	7	5	7	3	5	7	10	6.0	0.6
OPSPI	0	0	0	0	0	0	0	0	0	0	0.0	0.0
MUPO BAS	0	0	0	0	0	0	0	0	0	0	0.0	0.0
MUPO CAN	1	1	1	3	0	9	2	5	3	7	3.2	0.9
HIMU BAS	0	0	0	0	0	0	0	0	0	0	0.0	0.0
HIMU CAN	0	0	2	0	0	0	0	3	1	0	0.6	0.3
SPWR BAS	0	0	0	0	0	0	0	0	0	0	0.0	0.0
SPWR CAN	0	0	9	0	0	0	0	0	6	0	1.5	1.0
SEMA BAS	0	0	0	0	0	0	0	0	0	0	0.0	0.0
SEMA CAN	2	1	0	0	0	0	0	0	0	0	0.3	0.2
PPEAR	0	1	3	2	1	3	0	1	0	2	1.3	0.4
PAOB BAS	0	0	0	0	0	0	0	0	0	0	0.0	0.0
PAOB CAN	1	0	0	0	0	0	0	0	0	0	0.1	0.1
BOCU BAS	0	0	0	0	0	0	0	0	0	0	0.0	0.0
BOCU CAN	0	0	0	0	0	0	0	0	0	0	0.0	0.0

PLOT MD5

	1996	1999
SOIL		60.3
ROCK		4.2
BARE	67.3	64.5
LITTER	10.8	9.9
ANN FORB	0.1	0.1
PRGL	14.5	16.8
4WING	0.4	0.6
GUSA	4.2	6.0
OPSPI	0.2	0.0
MUPO BAS	0.1	0.0
MUPO CAN	2.1	3.2
HIMU BAS	0.2	0.0
HIMU CAN	0.6	0.6
SPWR BAS	0.2	0.0
SPWR CAN	0.5	1.5
SEMA BAS	0	0.0
SEMA CAN	0.1	0.3
PPEAR	0.5	1.3
PAOB BAS	0	0.0
PAOB CAN	0.1	0.1
BOCU BAS	0.1	0.0
BOCU CAN	0.1	0.0

SUMMARY TABLE, SAN BERNARDINO SITE

PLOT SB1	1996	1999
SOIL		58.5
ROCK		3.8
BARE	62.2	62.3
LITTER	5.3	3.0
TARBUSH	6.7	7.7
ARIS CAN	6.7	1.5
GUSA	6.6	8.7
MUPO CAN	5.7	4.3
PRGL	5.3	4.5
WHTHORN	3.8	5.0
ANN GRAS	1.7	4.3
FORB	1.0	3.5
SEMA CAN	0.0	0.8
HIMU CAN	0.0	1.0

PLOT SB2	1996	1999
SOIL		27.6
ROCK		3.8
BARE	35.1	31.4
LITTER	4.2	2.6
ANN GRAS	22.4	42.5
ARIS CAN	21.0	3.6
WHTHORN	16.0	6.5
GUSA	4.8	0.8
ANN FORB	2.9	17.9
PRGL	2.9	2.0
ARIS BAS	1.7	0.1
MUPO CAN	1.6	0.0

PLOT SB3	1996	1999
SOIL		15.3
ROCK		3.1
BARE	12.6	18.4
LITTER	2.5	4.0
ARIS CAN	44.2	9.6
ANN GRAS	29.4	39.4
HIMU CAN	9.0	14.1
WHTHORN	5.0	0.5
ARIS BAS	4.5	0.4
HIMU BAS	2.5	3.1
ANN FORB	2.0	21.3
GUSA	1.6	0.1
PRGL	1.4	0.9

PLOT SB4	1996	1999
SOIL		20.0
ROCK		4.8
BARE	17.9	24.8
LITTER	7.9	5.3
ANN GRAS	26.0	32.5
HIMU CAN	22.9	18.9
ANN FORB	10.4	14.0
ARIS CAN	9.4	0.6
WHTHORN	6.7	1.8
HIMU BAS	4.8	3.8
PRGL	2.9	2.4
PAOB CAN	2.4	3.0
ARIS BAS	1.0	0.0
SEDGE	0.0	2.4

PLOT SB5	1996	1999
SOIL		19.8
ROCK		2.1
BARE	18.7	21.9
LITTER	5.2	8.5
ANN GRAS	26.7	34.0
ANN FORB	19.3	20.3
ARIS CAN	17.0	1.3
HIMU CAN	13.3	7.4
WHTHORN	6.6	3.6
PAOB CAN	3.5	2.9
ARIS BAS	2.8	0.0
HIMU BAS	2.8	1.1
PRGL	2.1	0.5
LEDU CAN	1.2	0.0
PAOB BAS	0	0.3
SEDGE	0	3.9
SOEL	0	1.8
HODE	0	0.9

PLOT SB6	1996	1999
SOIL		23.1
ROCK		3.4
BARE	38.5	26.5
LITTER	6.2	8.3
ANN GRAS	30.2	38.9
HIMU CAN	8.0	6.1
WHTHORN	7.0	5.5
ANN FORB	5.7	13.5
ARIS CAN	4.7	0.3
PAOB CAN	2.6	0.1
SEDGE	1.4	9.0
PRGL	0.9	1.0
HIMU BAS	0	1.3

PLOT SB7	1996	1999
SOIL		27.5
ROCK		2.2
BARE	40.9	29.7
LITTER	6.6	2.2
ARIS CAN	11.9	2.7
PRGL	7.9	5.8
ANN FORB	7.5	41.5
ANN GRAS	7.1	9.8
WHTHORN	6.7	8.7
DICA CAN	5.6	0.3
MUPO CAN	4.1	2.3
GUSA	2.5	5.3
PAOB CAN	2.3	1.5
HIMU CAN	2.2	1.5
SEMA CAN	1.6	0.7
DICA BAS	1.4	0.0

PLOT SB8	1996	1999
SOIL		22.7
ROCK		4.8
BARE	30.8	27.5
LITTER	6.1	3.0
ANN GRAS	34.8	42.8
ARIS CAN	7.8	1.7
HIMU CAN	7.7	9.3
WHTHORN	7.5	3.0
ANN FORB	6.2	16.0
GUSA	2.6	0.3
PRGL	2.3	0.7
HIMU BAS	1.4	1.0

PLOT SB9	1996	1999
SOIL		19.7
ROCK		1.0
BARE	20.5	20.7
LITTER	9.9	3.3
HIMU CAN	32.3	31.0
PAOB CAN	19.7	10.2
ANN GRAS	13.5	24.5
ANN FORB	4.9	14.7
HIMU BAS	4.8	7.5
PRGL	3.6	1.0
WHTHORN	2.7	1.2
PAOB BAS	2.6	1.2
ARIS CAN	1.4	0.7
SPWR CAN	0.2	0.0
ARIS BAS	0.1	0.3
SPWR BAS	0.1	0.0
SEDGE	0	3.8

PLOT SB10	1996	1999
SOIL		12.2
ROCK		0.8
BARE	18.8	13.0
LITTER	9.5	6.5
HIMU CAN	24.9	23.5
ANN GRAS	18.3	27.0
PAOB CAN	9.5	12.3
ANN FORB	9.2	22.2
ARIS CAN	9	0.5
HIMU BAS	4.1	7.3
WHTHORN	2.4	2.3
PRGL	1.6	0.7
ARIS BAS	1.4	0.2
PAOB BAS	1.4	1.8
SEDGE	0	5.7
SOEL	0	1.0
HODE	0	1.3

PLOT SB11	1996	1999
SOIL		19.2
ROCK		3.0
BARE	26.6	22.2
LITTER	7.1	8.3
ANN GRAS	32.2	31.0
ANN FORB	12.6	18.3
HIMU CAN	12.6	9.8
WHTHORN	8.3	7.3
PAOB CAN	4.9	0.8
HIMU BAS	3.3	3.0
ARIS CAN	2.8	1.0
PRGL	1.6	1.8
SEDGE	0	9.2

PLOT SB12	1996	1999
SOIL		25.3
ROCK		4.8
BARE	34.2	30.2
LITTER	6.7	2.8
HIMU CAN	26.4	17.7
ANN GRAS	19.7	40.5
ANN FORB	9.0	6.8
WHTHORN	6.5	5.5
HIMU BAS	3.2	5.2
SEDGE	0	1.8

PLOT SB1
DATE OCT 2, 1996

	1	2	3	4	5	6	7	8	9	10	mean
BARE	72	77	62	72	55	42	67	74	54	47	62.2
LITTER	3	3	4	4	3	8	10	7	4	7	5.3
TARBUSH	7	5	11	7	12	6	5	0	8	6	6.7
ARIS CAN	3	4	8	2	9	15	1	6	8	11	6.7
GUSA	5	2	3	3	6	14	8	4	6	15	6.6
MUPO CAN	3	1	4	7	11	7	4	0	12	8	5.7
PRGL	6	8	8	6	5	8	4	0	2	6	5.3
WHTHORN	0	3	2	2	7	3	2	3	7	9	3.8
ANN GRAS	1	0	3	0	2	0	0	6	5	0	1.7
FORB	0	1	0	3	4	0	0	1	1	0	1.0

PLOT SB1 UNBURNED
DATE 25 Sep 99

	1	2	3	4	5	6	mean
SOIL	64	54	33	77	69	54	58.5
ROCK	3	6	3	7	2	2	3.8
BARE	67	60	36	84	71	56	62.3
LITTER	1	4	5	2	1	5	3.0
TARBUSH	10	8	2	5	13	8	7.7
ARIS CAN	0	2	7	0	0	0	1.5
GUSA	4	10	21	3	2	12	8.7
MUPO CAN	0	7	2	1	3	13	4.3
PRGL	8	6	9	1	1	2	4.5
WHTHORN	3	6	11	4	1	5	5.0
ANN GRAS	9	1	9	1	4	2	4.3
FORB	1	3	9	1	5	2	3.5
SEMA CAN	0	0	4	0	1	0	0.8
HIMU CAN	0	0	6	0	0	0	1.0

PLOT SB1	1996	1999
SOIL		58.5
ROCK		3.8
BARE	62.2	62.3
LITTER	5.3	3.0
TARBUSH	6.7	7.7
ARIS CAN	6.7	1.5

S.E.
3.7
0.7
1.1
1.3
1.4
1.2
0.8
0.8
0.7
0.4

S.E.
6.3
0.5
1.8
0.6
0.1
0.4
1.0
2.5
0.7
0.0
0.7
0.4
0.2
0.3

GUSA	6.6	8.7
MUPO CAN	5.7	4.3
PRGL	5.3	4.5
WHTHORN	3.8	5.0
ANN GRAS	1.7	4.3
FORB	1.0	3.5
SEMA CAN	0.0	0.8
HIMU CAN	0.0	1.0

PLOT SB2
DATE OCT 3, 1996

	1	2	3	4	5	6	7	8	9	10	mean
BARE	36	54	41	31	35	32	40	30	31	21	35.1
LITTER	7	2	2	3	7	7	4	3	1	6	4.2
FORB	3	0	7	4	4	0	0	0	7	4	2.9
PRGL	4	0	1	5	2	0	5	6	5	1	2.9
ANN GRAS	22	14	13	27	27	19	17	30	30	25	22.4
GUSA	12	5	4	6	1	2	7	2	6	3	4.8
ARIS BAS	0	1	5	1	4	1	2	1	2	0	1.7
ARIS CAN	12	17	21	17	19	25	28	22	19	30	21.0
MUPO CAN	1	2	4	2	1	2	2	0	0	2	1.6
WHTHORN	14	14	21	20	9	19	20	15	14	14	16.0

PLOT SB2 PARTLY BURNED
DATE 24-Sep-99

	1	2	3	4	5	6	7	8	mean
SOIL	36	27	30	32	18	26	20	32	27.6
ROCK	7	9	4	2	2	5	0	1	3.8
BARE	43	36	34	34	20	31	20	33	31.4
LITTER	2	4	3	5	3	1	0	3	2.6
FORB	12	18	15	15	20	16	26	21	17.9
PRGL	1	1	1	3	3	6	0	1	2.0
ANN GRAS	31	37	36	42	56	52	50	36	42.5
GUSA	0	0	1	1	0	0	0	4	0.8
ARIS BAS	0	1	0	0	0	0	0	0	0.1
ARIS CAN	7	3	4	0	3	3	3	6	3.6
MUPO CAN	0	0	0	0	0	0	0	0	0.0
WHTHORN	1	3	10	10	7	1	13	7	6.5

PLOT SB2	1996	1999
SOIL		27.6
ROCK		3.8
BARE	35.1	31.4
LITTER	4.2	2.6
ANN GRAS	22.4	42.5
ARIS CAN	21.0	3.6
WHTHORN	16.0	6.5
GUSA	4.8	0.8
ANN FORB	2.9	17.9
PRGL	2.9	2.0
ARIS BAS	1.7	0.1
MUPO CAN	1.6	0.0

S.E.
2.8
0.7
0.9
0.7
2.0
1.0
0.5
1.7
0.4
1.2

S.E.
2.2
1.1
2.8
0.6
1.6
0.7
3.2
0.5
0.1
0.8
0.0
1.6

PLOT SB3
DATE OCT 3, 1996

	1	2	3	4	5	6	7	8	9	10	mean
BARE	19	8	16	3	14	15	17	12	13	9	12.6
LITTER	2	1	1	4	1	1	3	3	4	5	2.5
FORB	1	5	0	2	2	1	4	0	1	4	2.0
PRGL	2	1	1	1	0	4	0	3	2	0	1.4
ANN GRAS	30	29	25	33	26	30	27	32	27	35	29.4
WHTHORN	5	3	7	0	3	3	10	8	4	7	5.0
GUSA	2	3	0	2	1	3	3	1	0	1	1.6
ARIS BAS	2	8	5	1	3	7	8	4	2	5	4.5
ARIS CAN	43	53	55	47	35	47	42	39	37	44	44.2
HIMU BAS	2	0	1	1	4	0	3	1	9	4	2.5
HIMU CAN	5	0	8	11	23	2	3	14	17	7	9.0

PLOT SB3 BURNED
DATE 24-Sep-99

	1	2	3	4	5	6	7	8	mean
SOIL	14	15	14	21	8	13	13	24	15.3
ROCK	4	2	3	0	3	4	6	3	3.1
BARE	18	17	17	21	11	17	19	27	18.4
LITTER	0	3	4	1	4	7	7	6	4.0
FORB	28	14	27	19	27	19	19	17	21.3
PRGL	1	0	1	1	2	0	1	1	0.9
ANN GRAS	51	36	41	39	35	32	42	39	39.4
WHTHORN	1	0	2	0	0	0	0	1	0.5
GUSA	1	0	0	0	0	0	0	0	0.1
ARIS BAS	1	0	0	1	0	0	1	0	0.4
ARIS CAN	5	11	5	12	6	23	9	6	9.6
HIMU BAS	2	3	3	3	5	3	3	3	3.1
HIMU CAN	11	23	17	15	14	11	15	7	14.1

PLOT SB3	1996	1999
SOIL		15.3
ROCK		3.1
BARE	12.6	18.4
LITTER	2.5	4.0
ARIS CAN	44.2	9.6
ANN GRAS	29.4	39.4
HIMU CAN	9.0	14.1
WHTHORN	5.0	0.5
ARIS BAS	4.5	0.4
HIMU BAS	2.5	3.1
ANN FORB	2.0	21.3
GUSA	1.6	0.1
PRGL	1.4	0.9

S.E.
1.5
0.5
0.6
0.4
1.0
0.9
0.4
0.8
2.1
0.9
2.3

S.E.
1.8
0.6
1.6
0.9
1.9
0.2
2.0
0.3
0.1
0.2
2.1
0.3
1.7

PLOT SB 4
DATE Oct 3, 1996

	1	2	3	4	5	6	7	8	9	10	MEAN	S.E.
BARE	21	15	22	20	20	12	13	20	14	22	17.9	1.2
LITTER	8	3	6	4	7	8	12	5	15	11	7.9	1.2
FORB	3	10	14	13	10	9	14	11	14	6	10.4	1.2
PRGL	1	1	4	1	2	1	2	2	11	4	2.9	1.0
ANN GRAS	23	45	32	22	13	39	41	16	16	13	26	3.9
WHTHORN	6	6	6	13	6	7	4	11	3	5	6.7	1.0
ARIS BAS	3	3	2	0	0	0	1	0	0	1	1	0.4
ARIS CAN	22	14	12	5	8	18	7	5	0	3	9.4	2.2
HIMU BAS	4	4	3	5	10	2	2	5	9	4	4.8	0.9
HIMU CAN	16	13	15	25	39	14	11	35	24	37	22.9	3.4
PAOB CAN	0	0	0	6	5	2	0	0	9	2	2.4	1.0

PLOT SB 4 BURNED
DATE 24-Sep-99

	1	2	3	4	5	6	7	8	MEAN	S.E.
SOIL	31	9	26	17	30	17	22	8	20.0	3.1
ROCK	3	2	4	10	6	3	6	4	4.8	0.9
BARE	34	11	30	27	36	20	28	12	24.8	3.4
LITTER	4	3	2	6	10	10	1	6	5.3	1.2
FORB	12	10	18	13	10	17	14	18	14.0	1.2
PRGL	2	1	3	3	2	1	4	3	2.4	0.4
ANN GRAS	39	32	37	35	15	22	31	49	32.5	3.7
WHTHORN	2	1	3	0	2	1	5	0	1.8	0.6
ARIS BAS	0	0	0	0	0	0	0	0	0.0	0.0
ARIS CAN	0	0	1	2	0	1	1	0	0.6	0.3
HIMU BAS	0	6	1	2	5	9	3	4	3.8	1.0
HIMU CAN	13	31	10	18	26	27	14	12	18.9	2.8
PAOB CAN	1	14	1	0	1	0	7	0	3.0	1.8
SEDGE	0	2	3	0	0	6	1	7	2.4	1.0

	1996	1999
SOIL		20.0
ROCK		4.8
BARE	17.9	24.8
LITTER	7.9	5.3
ANN GRAS	26.0	32.5
HIMU CAN	22.9	18.9
ANN FORB	10.4	14.0
ARIS CAN	9.4	0.6
WHTHORN	6.7	1.8
HIMU BAS	4.8	3.8
PRGL	2.9	2.4
PAOB CAN	2.4	3.0
ARIS BAS	1.0	0.0
SEDGE	0.0	2.4

PLOT SB 5
DATE Oct 3, 1996

	1	2	3	4	5	6	7	8	9	10	MEAN	S.E.
BARE	13	10	28	30	17	13	18	28	17	13	18.7	2.3
LITTER	3	1	7	2	3	6	3	15	7	5	5.2	1.3
FORB	25	26	18	10	4	38	36	10	11	15	19.3	3.7
PRGL	2	1	2	2	2	0	2	4	5	1	2.1	0.5
ANN GRAS	29	36	28	16	24	22	34	32	28	18	26.7	2.1
ARIS BAS	7	6	4	1	2	1	0	1	4	2	2.8	0.7
ARIS CAN	34	29	20	12	7	13	26	11	9	9	17	3.0
WHTHORN	7	10	7	13	4	0	9	4	11	1	6.6	1.4
LEDU CAN	4	1	0	0	3	3	1	0	0	0	1.2	0.5
PAOB BAS	0	0	0	0	0	0	0	0	0	0	0	0.0
PAOB CAN	3	0	0	0	9	8	0	0	0	15	3.5	1.7
HIMU BAS	0	1	0	6	4	0	0	1	6	10	2.8	1.1
HIMU CAN	0	2	0	21	37	2	0	6	26	39	13.3	5.0

PLOT SB 5 BURNED
DATE 23-Sep-99

	1	2	3	4	5	6	7	8	MEAN	S.E.
SOIL	19	17	16	32	12	19	22	21	19.8	2.1
ROCK	1	1	4	5	3	0	1	2	2.1	0.6
BARE	20	18	20	37	15	19	23	23	21.9	2.3
LITTER	11	6	14	1	26	4	3	3	8.5	2.9
FORB	25	21	18	17	19	19	14	29	20.3	1.7
PRGL	2	1	1	0	0	0	0	0	0.5	0.3
ANN GRAS	33	39	22	35	26	38	45	34	34.0	2.6
ARIS BAS	0	0	0	0	0	0	0	0	0.0	0.0
ARIS CAN	0	0	1	1	7	0	1	0	1.3	0.8
WHTHORN	2	3	6	5	2	4	2	5	3.6	0.6
LEDU CAN	0	0	0	0	0	0	0	0	0.0	0.0
PAOB BAS	0	0	0	0	0	1	1	0	0.3	0.2
PAOB CAN	4	5	0	0	0	6	8	0	2.9	1.2
HIMU BAS	0	1	4	0	1	2	1	0	1.1	0.5
HIMU CAN	8	8	14	0	4	14	8	3	7.4	1.8
SEDGE	6	1	11	1	2	3	0	7	3.9	1.3
SOEL	6	2	0	0	0	6	0	0	1.8	1.0
HODE	0	2	1	0	3	0	0	1	0.9	0.4

	1996	1999
SOIL		19.8
ROCK		2.1
BARE	18.7	21.9
LITTER	5.2	8.5
ANN GRAS	26.7	34.0
ANN FORB	19.3	20.3
ARIS CAN	17.0	1.3
HIMU CAN	13.3	7.4
WHTHORN	6.6	3.6
PAOB CAN	3.5	2.9
ARIS BAS	2.8	0.0
HIMU BAS	2.8	1.1
PRGL	2.1	0.5
LEDU CAN	1.2	0.0
PAOB BAS	0	0.3
SEDGE	0	3.9
SOEL	0	1.8
HODE	0	0.9

PLOT SB 6
DATE Oct 4, 1996

	1	2	3	4	5	6	7	8	9	10	mean	S.E.
BARE	42	31	40	49	48	44	26	39	30	36	38.5	2.4
LITTER	1	3	5	6	5	9	10	7	6	10	6.2	0.9
FORB	2	1	3	7	4	4	14	7	10	5	5.7	1.2
PRGL	0	2	2	0	0	0	1	0	2	2	0.9	0.3
ANN GRAS	27	37	26	23	24	35	33	33	41	23	30.2	2.0
ARIS CAN	11	3	4	3	2	6	10	5	1	2	4.7	1.1
WHTHORN	12	12	11	7	7	2	3	5	3	8	7.0	1.2
SEDGE	2	3	0	1	0	0	4	0	3	1	1.4	0.5
HIMU BAS	0	0	0	0	0	0	0	0	0	0	0	0.0
HIMU CAN	11	12	6	3	12	3	11	2	5	15	8.0	1.5
PAOB CAN	0	2	3	5	3	0	4	9	0	0	2.6	0.9

PLOT SB 6 BURNED
DATE 23-Sep-99

	1	2	3	4	5	6	7	8	mean	S.E.
SOIL	15	17	36	22	15	27	28	25	23.1	2.6
ROCK	3	3	2	8	1	2	8	0	3.4	1.1
BARE	18	20	38	30	16	29	36	25	26.5	2.9
LITTER	13	10	13	15	3	5	3	4	8.3	1.8
FORB	24	9	5	18	11	9	21	11	13.5	2.4
PRGL	0	4	1	2	0	0	0	1	1.0	0.5
ANN GRAS	31	47	40	26	43	45	33	46	38.9	2.8
ARIS CAN	1	1	0	0	0	0	0	0	0.3	0.2
WHTHORN	6	8	1	5	10	7	5	2	5.5	1.1
SEDGE	14	10	2	6	18	11	7	4	9.0	1.9
HIMU BAS	1	0	1	1	4	2	0	1	1.3	0.5
HIMU CAN	7	4	4	3	13	7	1	10	6.1	1.4
PAOB CAN	1	0	0	0	0	0	0	0	0.1	0.1

PLOT SB6	1996	1999
SOIL		23.1
ROCK		3.4
BARE	38.5	26.5
LITTER	6.2	8.3
ANN GRAS	30.2	38.9
HIMU CAN	8.0	6.1
WHTHORN	7.0	5.5
ANN FORB	5.7	13.5
ARIS CAN	4.7	0.3
PAOB CAN	2.6	0.1
SEDGE	1.4	9.0
PRGL	0.9	1.0
HIMU BAS	0	1.3

PLOT SB 7
DATE Oct 4, 1996

	1	2	3	4	5	6	7	8	9	10	mean	S.E.
BARE	51	58	38	38	34	39	51	55	23	22	40.9	4.0
LITTER	5	2	7	8	5	13	10	6	6	4	6.6	1.0
ARIS CAN	14	13	10	7	14	20	5	7	16	13	11.9	1.5
PRGL	6	8	12	6	4	11	7	8	12	5	7.9	0.9
FORB	2	3	7	11	8	5	4	7	12	16	7.5	1.4
ANN GRAS	0	1	11	3	11	1	7	11	12	14	7.1	1.7
WHTHORN	14	7	3	10	1	11	10	4	1	6	6.7	1.4
DICA CAN	0	0	7	8	12	0	1	3	18	7	5.6	1.9
MUPO CAN	4	7	6	6	1	2	7	2	5	1	4.1	0.8
GUSA	7	5	3	0	1	3	4	0	0	2	2.5	0.7
PAOB CAN	0	0	1	8	8	0	0	0	4	2	2.3	1.0
HIMU CAN	0	0	1	1	6	0	0	0	3	11	2.2	1.2
SEMA CAN	3	1	3	0	1	5	3	0	0	0	1.6	0.6
DICA BAS	0	0	0	3	4	0	0	0	4	3	1.4	0.6

PLOT SB 7 PARTLY BURNED
DATE 25-Sep-99

	1	2	3	4	5	6	mean	S.E.
SOIL	31	15	12	37	42	28	27.5	4.9
ROCK	2	0	1	3	4	3	2.2	0.6
BARE	33	15	13	40	46	31	29.7	5.4
LITTER	4	2	1	4	2	0	2.2	0.7
ARIS CAN	2	3	5	4	1	1	2.7	0.7
PRGL	9	3	6	7	2	8	5.8	1.1
FORB	46	60	60	12	24	47	41.5	8.0
ANN GRAS	14	11	18	3	3	10	9.8	2.4
WHTHORN	5	3	2	17	20	5	8.7	3.2
DICA CAN	2	0	0	0	0	0	0.3	0.3
MUPO CAN	3	1	0	6	4	0	2.3	1.0
GUSA	5	0	1	16	9	1	5.3	2.5
PAOB CAN	1	3	3	0	0	2	1.5	0.6
HIMU CAN	0	3	6	0	0	0	1.5	1.0
SEMA CAN	0	0	0	2	1	1	0.7	0.3
DICA BAS	0	0	0	0	0	0	0.0	0.0

PLOT SB7	1996	1999
SOIL		27.5
ROCK		2.2
BARE	40.9	29.7
LITTER	6.6	2.2
ARIS CAN	11.9	2.7
PRGL	7.9	5.8
ANN FORB	7.5	41.5
ANN GRAS	7.1	9.8
WHTHORN	6.7	8.7
DICA CAN	5.6	0.3
MUPO CAN	4.1	2.3
GUSA	2.5	5.3
PAOB CAN	2.3	1.5
HIMU CAN	2.2	1.5
SEMA CAN	1.6	0.7
DICA BAS	1.4	0.0

PLOT SB 8
DATE Oct 7, 1996

	1	2	3	4	5	6	7	8	9	10	mean
BARE	39	33	24	36	35	34	22	42	20	23	30.8
LITTER	2	6	8	6	7	5	5	8	4	10	6.1
ANN GRAS	33	44	45	33	15	33	48	33	39	25	34.8
ARIS CAN	10	5	9	2	7	15	8	6	8	8	7.8
HIMU CAN	0	1	5	8	21	0	7	3	16	16	7.7
WHTHORN	5	4	7	16	9	6	6	0	12	10	7.5
FORB	5	6	1	3	3	11	2	6	8	17	6.2
GUSA	9	1	7	1	0	4	1	0	2	1	2.6
PRGL	5	3	0	1	5	0	5	2	0	2	2.3
HIMU BAS	0	0	1	1	4	0	1	0	3	4	1.4

PLOT SB 8 BURNED
DATE 24-Sep-99

	1	2	3	4	5	6	mean
SOIL	31	37	24	14	16	14	22.7
ROCK	1	2	10	7	4	5	4.8
BARE	32	39	34	21	20	19	27.5
LITTER	2	3	2	3	4	4	3.0
ANN GRAS	35	42	26	49	57	48	42.8
ARIS CAN	1	3	0	1	0	5	1.7
HIMU CAN	8	7	16	12	6	7	9.3
WHTHORN	1	6	4	5	1	1	3.0
FORB	24	7	17	12	13	23	16.0
GUSA	1	1	0	0	0	0	0.3
PRGL	0	0	2	1	1	0	0.7
HIMU BAS	2	0	1	1	1	1	1.0

PLOT SB8	1996	1999
SOIL		22.7
ROCK		4.8
BARE	30.8	27.5
LITTER	6.1	3.0
ANN GRAS	34.8	42.8
ARIS CAN	7.8	1.7
HIMU CAN	7.7	9.3
WHTHORN	7.5	3.0
ANN FORB	6.2	16.0
GUSA	2.6	0.3
PRGL	2.3	0.7
HIMU BAS	1.4	1.0

S.E.
2.5
0.7
3.1
1.1
2.4
1.4
1.5
1.0
0.7
0.5

S.E.
4.0
1.4
3.5
0.4
4.5
0.8
1.6
0.9
2.7
0.2
0.3
0.3

PLOT SB 9
DATE Oct 7, 1996

	1	2	3	4	5	6	7	8	9	10	MEAN	S.E.
BARE	20	21	29	21	21	20	12	22	17	22	20.5	1.3
LITTER	12	12	5	12	7	6	14	10	15	6	9.9	1.2
HIMU CAN	32	33	23	21	34	55	38	32	31	24	32.3	3.1
PAOB CAN	9	13	20	26	16	4	20	22	35	32	19.7	3.1
ANN GRAS	21	17	14	7	13	12	8	14	22	7	13.5	1.7
FORB	0	4	6	11	4	2	10	2	6	4	4.9	1.1
HIMU BAS	4	5	0	2	3	6	5	10	9	4	4.8	1.0
PRGL	6	3	3	3	4	3	4	4	2	4	3.6	0.3
WHTHORN	7	1	5	2	3	2	0	0	4	3	2.7	0.7
PAOB BAS	0	2	3	3	4	0	3	3	2	6	2.6	0.6
ARIS CAN	0	0	2	1	1	0	0	1	4	5	1.4	0.6
SPWR CAN	1	0	0	0	0	0	0	0	1	0	0.2	0.1
ARIS BAS	0	0	0	0	0	0	0	0	1	0	0.1	0.1
SPWR BAS	0	0	0	0	0	0	0	0	1	0	0.1	0.1

PLOT SB 9 BURNED
DATE 24-Sep-99

	1	2	3	4	5	6	MEAN	S.E.
SOIL	11	26	20	15	20	26	19.7	2.4
ROCK	1	0	2	0	2	1	1.0	0.4
BARE	12	26	22	15	22	27	20.7	2.4
LITTER	0	5	5	2	6	2	3.3	1.0
HIMU CAN	50	23	16	53	17	27	31.0	6.7
PAOB CAN	0	10	25	0	22	4	10.2	4.5
ANN GRAS	26	19	28	25	23	26	24.5	1.3
ANN FORB	18	18	14	12	16	10	14.7	1.3
HIMU BAS	10	1	6	15	7	6	7.5	1.9
PRGL	1	0	0	0	3	2	1.0	0.5
WHTHORN	0	1	3	0	0	3	1.2	0.6
PAOB BAS	0	1	5	0	1	0	1.2	0.8
ARIS CAN	2	1	1	0	0	0	0.7	0.3
SPWR CAN	0	0	0	0	0	0	0.0	0.0
ARIS BAS	1	0	1	0	0	0	0.3	0.2
SPWR BAS	0	0	0	0	0	0	0.0	0.0
SEDGE	5	4	2	3	2	7	3.8	0.8

PLOT SB9	1996	1999
SOIL		19.7
ROCK		1.0
BARE	20.5	20.7
LITTER	9.9	3.3
HIMU CAN	32.3	31.0
PAOB CAN	19.7	10.2
ANN GRAS	13.5	24.5
ANN FORB	4.9	14.7
HIMU BAS	4.8	7.5
PRGL	3.6	1.0
WHTHORN	2.7	1.2
PAOB BAS	2.6	1.2
ARIS CAN	1.4	0.7
SPWR CAN	0.2	0.0
ARIS BAS	0.1	0.3
SPWR BAS	0.1	0.0
SEDGE	0	3.8

PLOT SB 10
DATE Oct 7, 1996

	1	2	3	4	5	6	7	8	9	10	mean	S.E.
BARE	9	15	9	22	5	23	19	12	22	52	18.8	4.2
LITTER	15	5	17	1	12	9	15	7	11	3	9.5	1.7
HIMU CAN	20	45	32	6	12	22	40	46	19	7	24.9	4.8
ANN GRAS	17	19	6	34	29	18	17	14	12	17	18.3	2.5
PAOB CAN	21	0	15	10	4	17	2	15	11	0	9.5	2.4
FORB	6	5	16	21	22	2	1	3	10	6	9.2	2.5
ARIS CAN	11	12	1	11	15	8	4	2	12	14	9.0	1.6
HIMU BAS	9	9	3	0	1	2	8	5	3	1	4.1	1.1
WHTHORN	0	0	4	7	1	5	1	0	0	6	2.4	0.9
PRGL	0	1	1	4	3	2	1	1	2	1	1.6	0.4
ARIS BAS	3	2	0	1	0	0	1	1	3	3	1.4	0.4
PAOB BAS	6	0	3	1	1	0	0	1	2	0	1.4	0.6

PLOT SB 10 BURNED
DATE 24-Sep-99

	1	2	3	4	5	6	mean	S.E.
SOIL	5	7	8	37	10	6	12.2	5.0
ROCK	1	0	1	0	3	0	0.8	0.5
BARE	6	7	9	37	13	6	13.0	4.9
LITTER	12	3	3	8	9	4	6.5	1.5
HIMU CAN	24	44	30	7	34	2	23.5	6.6
ANN GRAS	28	29	15	29	27	34	27.0	2.6
PAOB CAN	19	4	24	4	3	20	12.3	3.9
FORB	17	17	16	17	25	41	22.2	4.0
ARIS CAN	0	0	0	1	0	2	0.5	0.3
HIMU BAS	8	14	16	2	3	1	7.3	2.6
WHTHORN	0	0	2	7	4	1	2.3	1.1
PRGL	0	1	0	2	0	1	0.7	0.3
ARIS BAS	0	0	0	1	0	0	0.2	0.2
PAOB BAS	4	0	0	1	0	6	1.8	1.0
SEDGE	2	6	16	4	1	5	5.7	2.2
SOEL	1	1	4	0	0	0	1.0	0.6
HODE	1	4	1	2	0	0	1.3	0.6

PLOT SB10	1996	1999
SOIL		12.2
ROCK		0.8
BARE	18.8	13.0
LITTER	9.5	6.5
HIMU CAN	24.9	23.5
ANN GRAS	18.3	27.0
PAOB CAN	9.5	12.3
ANN FORB	9.2	22.2
ARIS CAN	9	0.5
HIMU BAS	4.1	7.3
WHTHORN	2.4	2.3
PRGL	1.6	0.7
ARIS BAS	1.4	0.2
PAOB BAS	1.4	1.8
SEDGE	0	5.7
SOEL	0	1.0

PLOT SB 11
DATE Oct 7, 1996

	1	2	3	4	5	6	7	8	9	10	mean	S.E.
BARE	43	42	31	31	12	23	16	27	16	25	26.6	3.3
LITTER	4	3	2	5	10	5	9	14	7	12	7.1	1.3
FORB	1	14	6	13	15	9	12	10	21	25	12.6	2.2
PRGL	2	2	5	0	1	1	2	2	1	0	1.6	0.5
ANN GRAS	30	37	38	12	34	31	56	26	23	35	32.2	3.6
HIMU BAS	2	1	4	7	4	5	1	1	4	4	3.3	0.6
HIMU CAN	9	4	5	27	12	20	3	13	22	11	12.6	2.6
PAOB CAN	0	0	2	4	22	0	0	4	16	1	4.9	2.4
ARIS CAN	3	0	6	2	1	2	6	2	1	5	2.8	0.7
WHTHORN	10	5	12	10	5	14	1	12	10	4	8.3	1.3

PLOT SB 11
DATE 24-Sep-99

	1	2	3	4	5	6	mean	S.E.
SOIL	24	29	20	13	25	4	19.2	3.8
ROCK	0	3	4	4	5	2	3.0	0.7
BARE	24	32	24	17	30	6	22.2	3.9
LITTER	10	5	10	7	6	12	8.3	1.1
FORB	16	19	15	25	14	21	18.3	1.7
PRGL	4	4	0	1	1	1	1.8	0.7
ANN GRAS	19	34	34	33	22	44	31.0	3.7
HIMU BAS	7	1	0	1	7	2	3.0	1.3
HIMU CAN	18	3	6	3	17	12	9.8	2.8
PAOB CAN	0	0	2	0	0	3	0.8	0.5
ARIS CAN	0	1	0	2	1	2	1.0	0.4
WHTHORN	9	4	8	11	8	4	7.3	1.1
SEDGE	8	3	6	14	7	17	9.2	2.2

PLOT SB11	1996	1999
SOIL		19.2
ROCK		3.0
BARE	26.6	22.2
LITTER	7.1	8.3
ANN GRAS	32.2	31.0
ANN FORB	12.6	18.3
HIMU CAN	12.6	9.8
WHTHORN	8.3	7.3
PAOB CAN	4.9	0.8
HIMU BAS	3.3	3.0
ARIS CAN	2.8	1.0
PRGL	1.6	1.8
SEDGE	0	9.2

PLOT	SB12										
DATE	Oct 4, 1996										
	1	2	3	4	5	6	7	8	9	10	mean
BARE	60	45	14	11	43	43	35	25	33	33	34.2
LITTER	4	3	5	7	7	16	7	5	9	4	6.7
FORB	13	7	3	1	17	6	16	13	8	6	9.0
ANN GRAS	18	26	6	13	12	17	26	32	29	18	19.7
WHTHORN	10	7	10	2	5	9	3	3	7	9	6.5
HIMU BAS	0	2	5	4	1	2	3	3	5	7	3.2
HIMU CAN	3	18	64	67	18	14	15	15	17	33	26.4

PLOT	SB12						
DATE	25-Sep-99						
	1	2	3	4	5	6	mean
SOIL	43	28	11	23	19	28	25.3
ROCK	3	7	0	6	6	7	4.8
BARE	46	35	11	29	25	35	30.2
LITTER	1	2	1	8	3	2	2.8
ANN FORB	10	6	4	7	5	9	6.8
ANN GRAS	38	46	40	29	54	36	40.5
WHTHORN	7	10	1	9	2	4	5.5
HIMU BAS	1	2	13	4	8	3	5.2
HIMU CAN	2	16	46	13	15	14	17.7
SEDGE	1	1	6	2	0	1	1.8

PLOT SB12	1996	1999
SOIL		25.3
ROCK		4.8
BARE	34.2	30.2
LITTER	6.7	2.8
HIMU CAN	26.4	17.7
ANN GRAS	19.7	40.5
ANN FORB	9.0	6.8
WHTHORN	6.5	5.5
HIMU BAS	3.2	5.2
SEDGE	0	1.8

Report to the Malpai Borderlands Group:

Pre-Treatment Sampling of Vegetation Manipulation Plots in the Malpai Borderlands Area

Peter Sundt
HCO1 Box 5610, Pima, Arizona 85543

January 6, 1996

Introduction

This study was initiated to study methods of reducing encroachment of woody shrubs and trees and of revegetating areas with native grasses on rangelands of the Malpai Borderlands area. The study is coordinated by Carl Edminster of the U.S. Forest Service Rocky Mountain Forest and Range Experiment Station. Study locations include the San Bernardino National Wildlife Refuge, the Malpai Ranch, the Sycamore Ranch, the Roos Ranch, and the Gray Ranch. Treatments will include 1) roller chopping alone, 2) roller chopping and seeding, 3) roller chopping, seeding, and intensive grazing, and 4) untreated control. At the Sycamore Ranch the study site is an archeological site, and there the proposed treatments include 1) congregating livestock into a small area and feeding native grass hay, 2) hand cutting of mesquite, and 3) untreated control.

Pre-treatment sampling of the study plots was accomplished in fall 1996 by a crew of four, including Peter Sundt, Kei Sundt, Jeff Caspary and Scott Carroll.

Methods

The vegetation was sampled using the point intercept cover method, as recommended by the Malpai Borderlands Group Science Advisory Committee. The method estimates the amount of ground area covered by each of the plant species present by locating 1000 points within the study plot and identifying the plant species (or litter or bare ground) intercepted by each point. The cover of each species is estimated by the percentage of the total number of points at which the species occurs.

At each of the study sites, with the exception of Sycamore Ranch, a set of 12 contiguous experimental plots, each 500ft square, were laid out and marked with steel fence posts. To avoid confusion, I will refer to the set of 12 plots at a study site as the "grid", and to the plots within the grid as "plots." The arrangement, grid coordinate numbers and plot numbers are included in the photo plans (see below) for each site. (At Sycamore Ranch 5 plots, each 300ft X 100m, were established in an irregular arrangement, and labeled M1-M5 on the photo plan). The grids were labeled with x-y coordinate numbers at each post, beginning at 0,0 and continuing at 500ft intervals in 2 directions through (in most cases) 1000,3000. The plots were also numbered 1-12, and those numbers were used to identify the data sets (e.g. ER1, the plot labeled 1 on the photo plan for the Roos Ranch site).

At each plot a 300ft baseline was temporarily established by stretching a 300ft tape along a line parallel to one plot boundary, but inset 100ft from both boundaries. The baseline

was inset from the plot boundaries by 1) determining the compass direction of the long axis of the grid of plots, 2) moving 122ft from the plot corner post along a line 45 degrees from the grid axis to establish one end of the baseline, 3) stretching the tape 300ft parallel to the grid long axis to determine the other end of the baseline (see Figure 1). Ten parallel 100m transects were established perpendicular to the baseline and at 30ft intervals (starting at 0ft and ending at 270ft). 100 sample points were located along each transect, at 1m marks on the tape. At each sample point the observer used a straight brass brazing rod to help identify the plant species occurring there. If the canopies of more than one plant species coexisted at a point, all were recorded. Litter (any dead organic matter) or bare ground were recorded if no plant canopy existed at the point. For all perennial grasses, hits on plant basal crowns were segregated from hits on non-basal parts of the canopy (i.e. leaves or inflorescences). Annual forbs, annual grasses, and species of Aristida were lumped. Data were kept separate for each transect, to allow calculation of variance within the plot.

Photos were made of each plot with a 35mm camera on a tripod. The photos (4X5 prints and negatives) accompany this report, and the photo logs and plans showing the location and direction of each photo are included below.

The Data

All of the pre-treatment data has been digitized by entry into Lotus 123 spreadsheets, and is included on the diskette accompanying this report. Plot data files are identified by the year, grid abbreviation, and plot numbers, for example 96ER1. Grid abbreviations are: ER = Roos Ranch, GW = George Wright pasture, Gray Ranch, WG = Glenn (Malpai Ranch), SB = San Bernardino Wildlife Refuge, MD = McDonald (Sycamore Ranch).

Plant species names used in the digitized data are those used on the field forms, and include common names, abbreviated scientific names, and field code names. A table of field codes, common names, and scientific names is included below. For perennial grasses both basal and canopy hits were recorded in the field. In the digitized data, basal hits are indicated by the species name, while canopy hits are indicated by the name + LF (for leaf). For example, a basal hit on blue grama was recorded in the row BOGR, while a canopy hit was recorded in the row BOGR LF. For an accurate assessment of canopy cover, it is necessary to add the basal and LF hits (since a basal hit is included within the plant canopy), and this has not been done.

Means and standard errors have been calculated for the percent cover estimates for each species. Comparison of pre- and post-treatment means of species of interest will allow an evaluation of the effectiveness of the treatments.

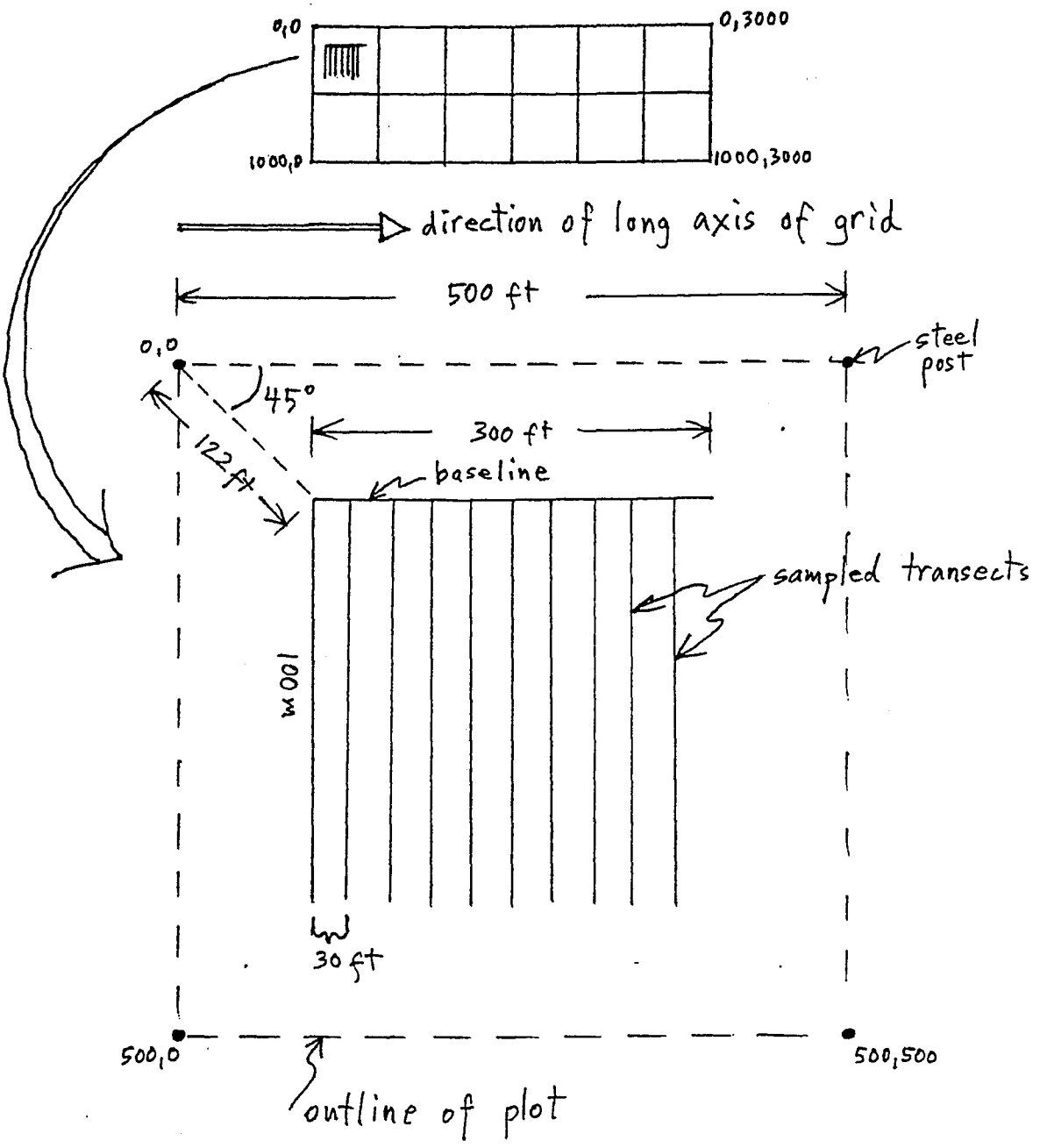


Figure 1. Manner of locating baselines and transects within sample plots.

PHOTO PLANS, MALPAI AREA VEGETATION TREATMENT PROJECT, 1996

These plans indicate schematically the layouts of the five treatment macroplots. The circled numbers in the center of each sampled plot (500ft x 500ft in all cases but the McDonald site), are those used in identifying the data sets. The coordinate numbers (from 0,0 to 1000,3000) correspond to those written on the steel corner posts of each sample plot; these coordinate numbers are used in the photo log to identify the locations of each photo station. The directions and frame numbers of each photo taken from each photo station are indicated on the plans. The azimuth directions for each photo are with reference to a 0 degree azimuth, the magnetic compass direction of which is recorded in the log and which is usually in line with the long axis of the macroplot. The frame numbers of the photos taken on a single roll of film are separated on the plan by a dotted line, with each set identified with the film roll name used in the photo log (e.g. Rolls WG1 and WG2 for the Glenn Ranch treatment plots).

Photo plan – George Wright treatment plots. Sept. 18, 1996.

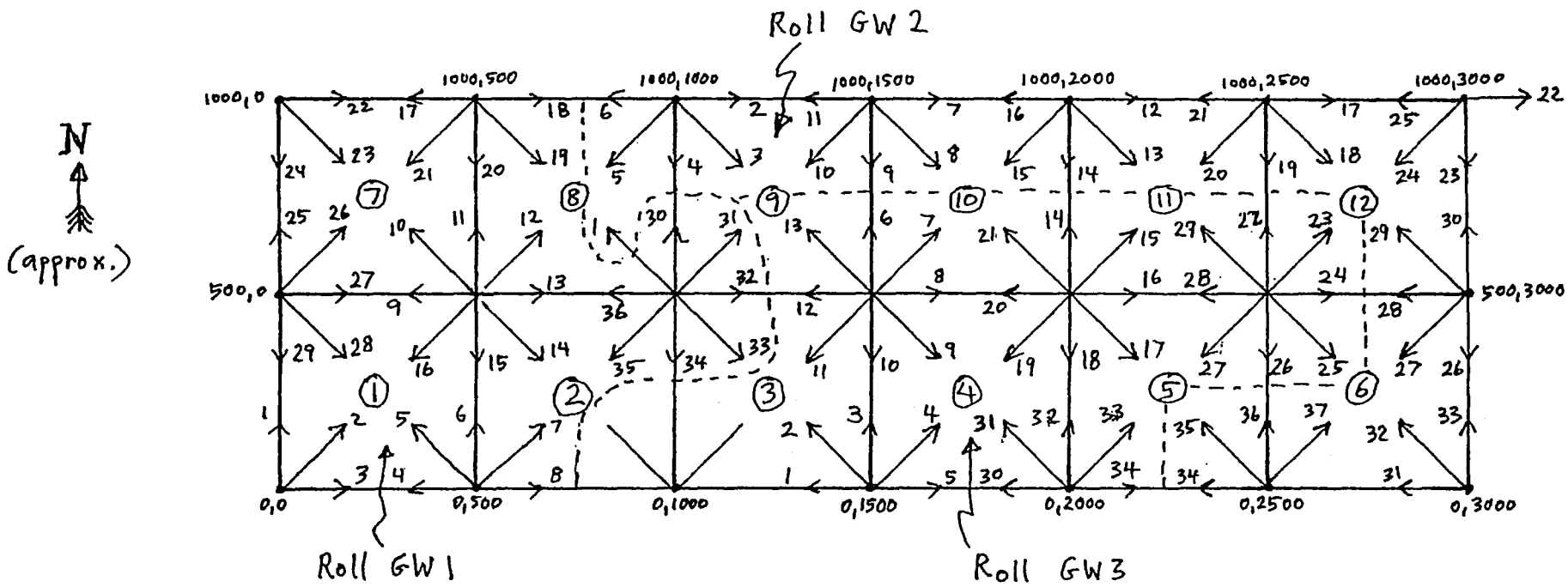


Photo plan — Roos Ranch treatment plots. Oct. 1, 1996

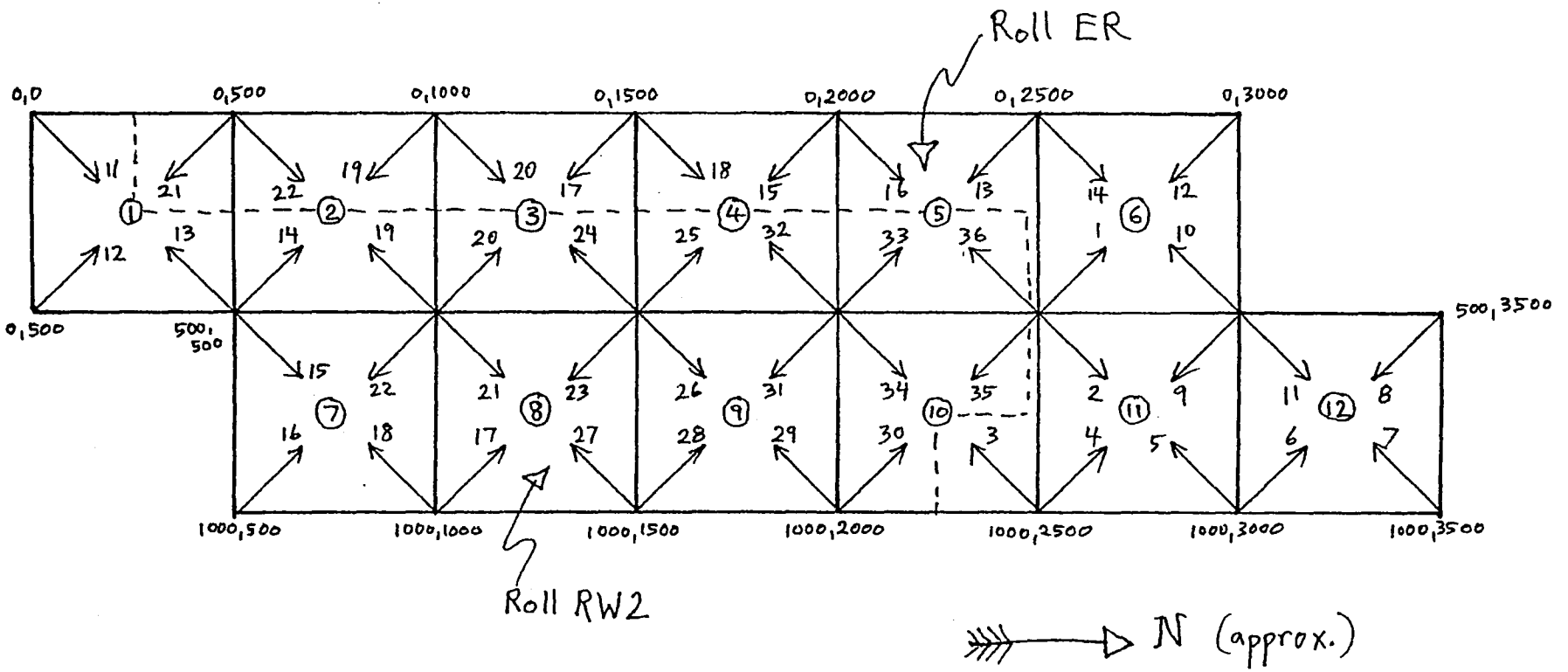


Photo plan — Glenn Ranch treatment plots. Oct. 15, 1996.

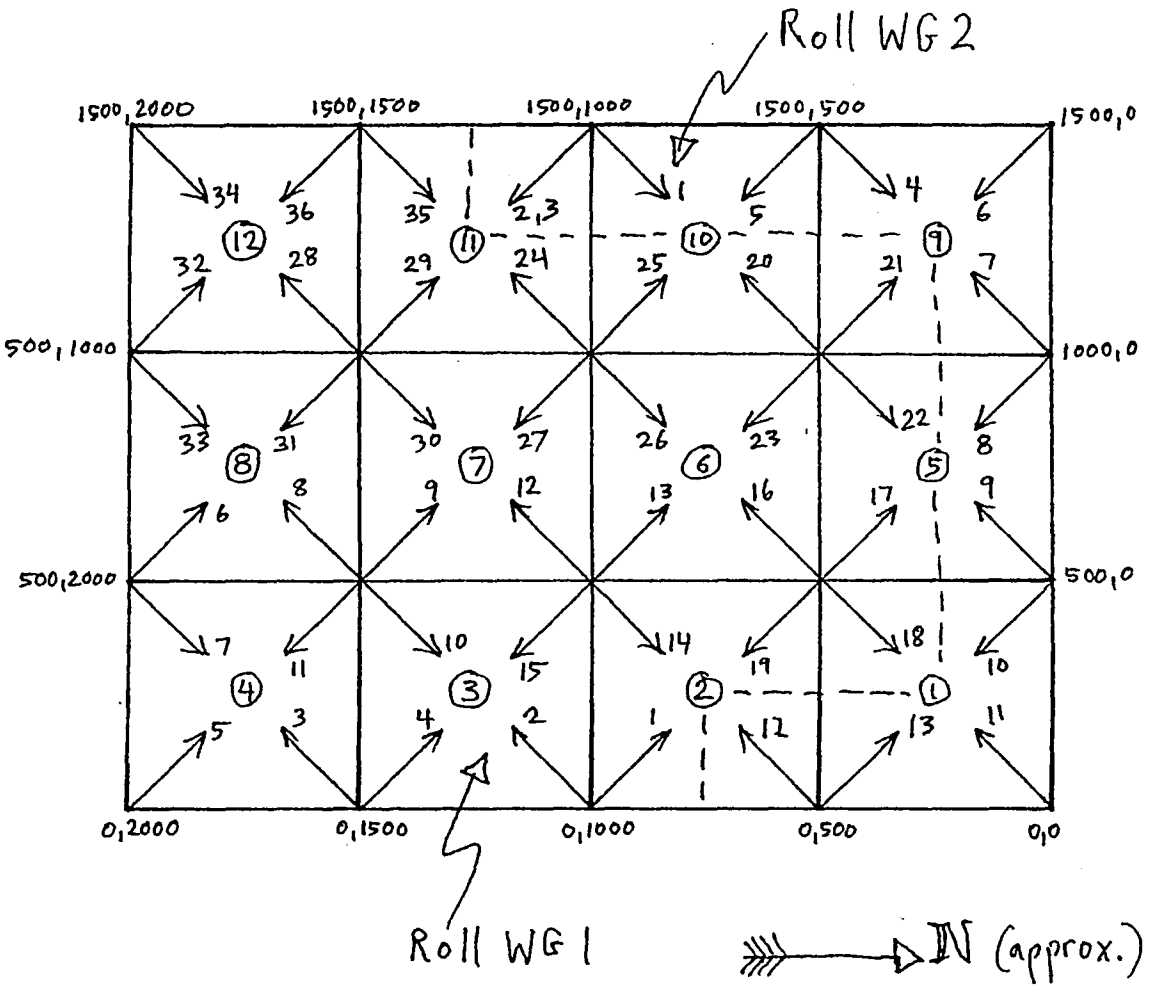


Photo plan — San Bernardino Refuge treatment plots. Oct. 15, 1996.

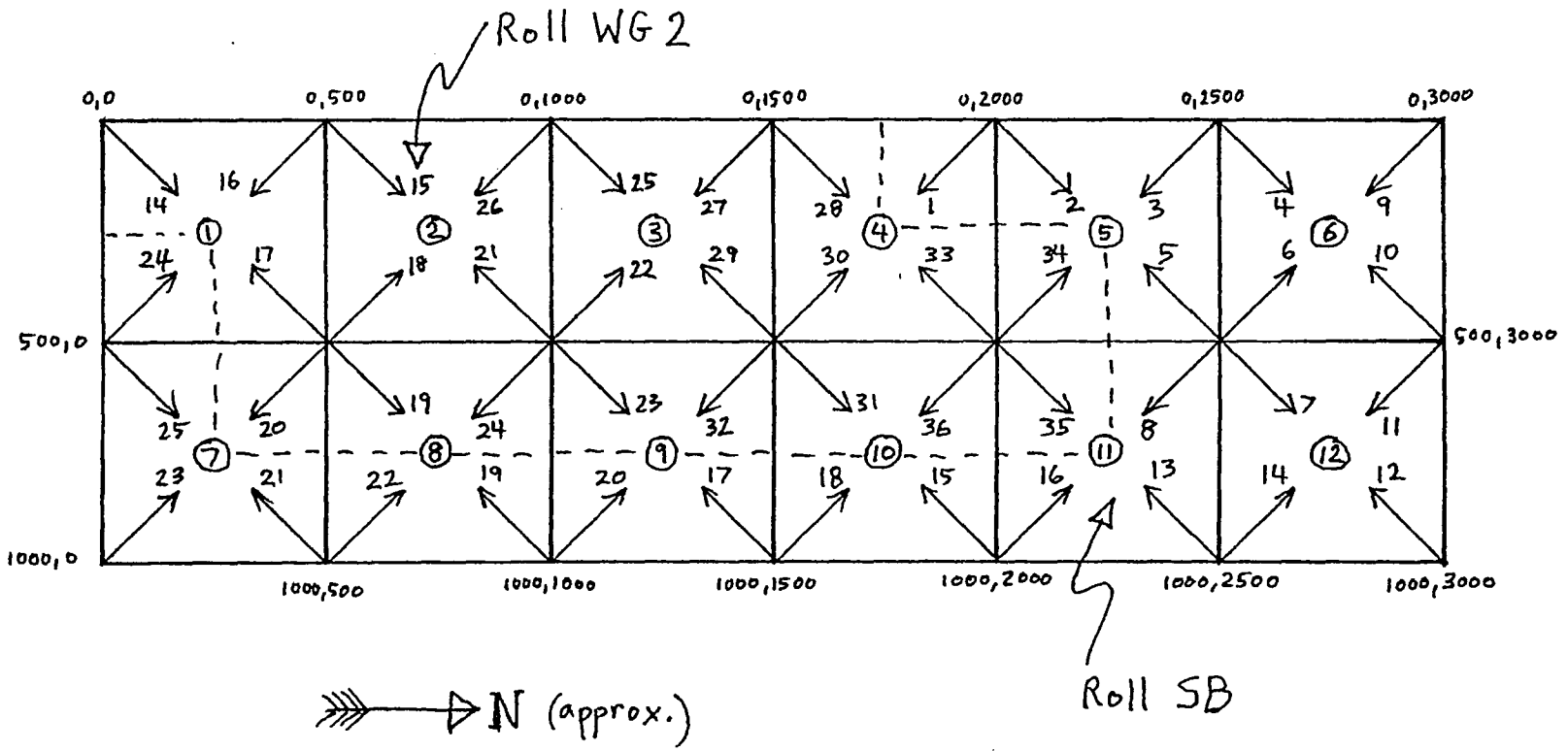
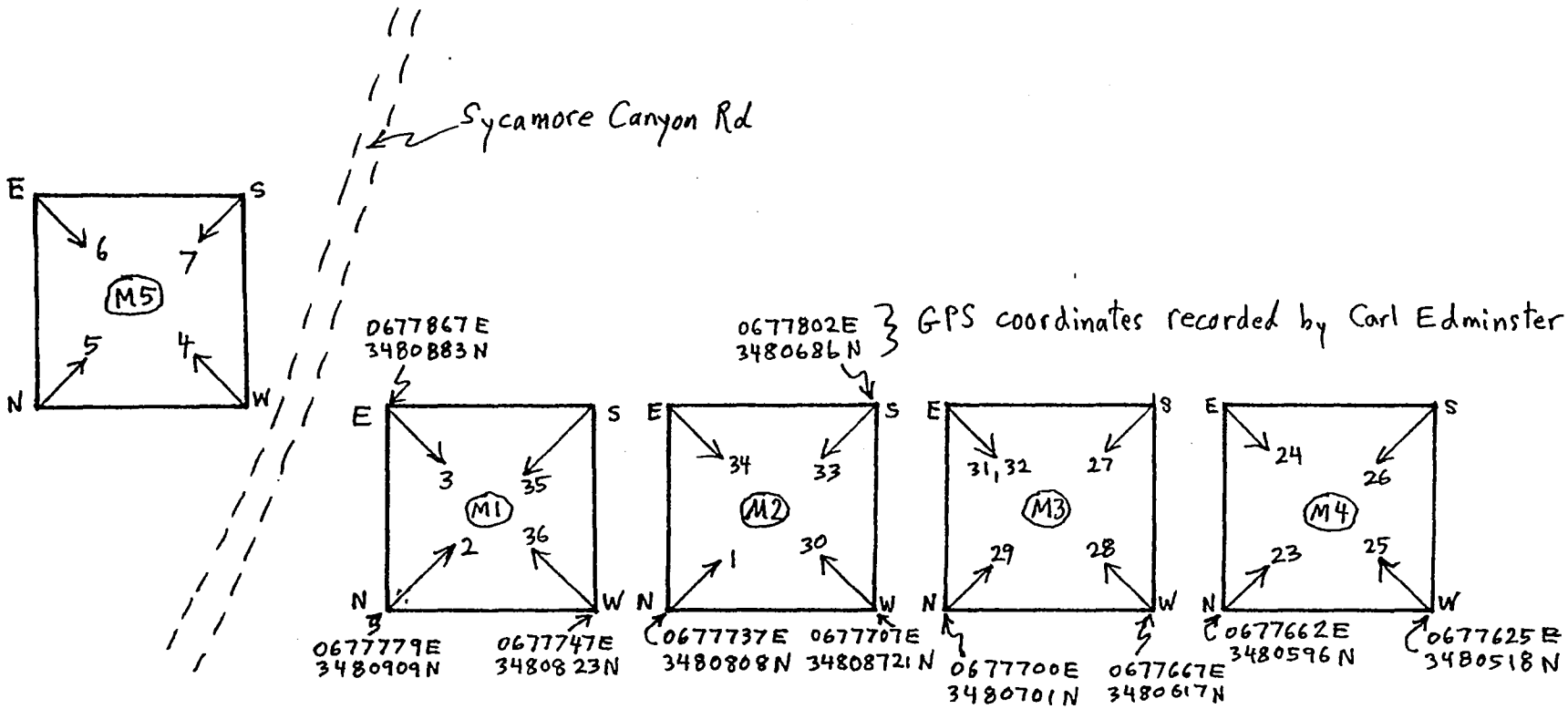


Photo plan – McDonald Ranch treatment plots. Oct. 18, 1996.



N (approx.)

Roll GM frames 23-36

Roll MD frames 1-7

Camera: Olympus IS-3 DLX Tripod height: 160cm Focal length 35 unless noted otherwise
George Wright plots. Stations identified by plot coordinates.

Roll	Frame	Station	Azimuth	Notes
GW1	1	0,0	0	0 azimuth set to N-S boundary line, =315 magnetic
	2		45	Film: TMax 100. Date: Sept 18, 1996
	3		90	
	4	0,500	0	0 azimuth set to 225 magnetic
	5		45	
	6		90	
	7		135	
	8		180	
	9	500,500	0	set to 225 magnetic
	10		45	
	11		90	
	12		135	
	13		180	
	14		225	
	15		270	
	16		315	
	17	1000,500	0	set to 225 magnetic
	18		180	
	19		225	
	20		270	
	21		315	
	22	1000,0	0	
	23		45	
	24		90	
	25	500,0	0	set at 315 magnetic
	26		45	
	27		90	
	28		135	
	29		180	
	30	500,1000	0	set at 315 magnetic
	31		45	
	32		90	
	33		135	
	34		180	
	35		225	
	36		270	
GW2	1		315	Film: TMax 100
	2	1000,1000	0	set to 45 magnetic
	3		45	
	4		90	
	5		135	
	6		180	
	7	1000,1500	0	set to 45 magnetic
	8		45	
	9		90	

Roll	Frame	Station	Azimuth	Notes
	10		135	
	11		180	
	12	1000,2000	0	set to 45 magnetic
	13		45	
	14		90	
	15		135	
	16		180	
	17	1000,2500	0	set to 45 magnetic
	18		45	
	19		90	
	20		135	
	21		180	
	22	1000,3000	0	set to 45 magnetic
	23		90	
	24		135	
	25		180	
	26	500,3000	0	set to 135 magnetic
	27		45	
	28		90	
	29		135	
	30		180	
	31	0,3000	0	set to 225 magnetic
	32		45	
	33		90	
	34	0,2500	0	set to 225 magnetic
	35		45	
	36		90	
	37		135	
GW3	1	0,1500	0	set to 225 magnetic
	2		45	Film: TMax 100
	3		90	
	4		135	
	5		180	
	6	500, 1500	0	set to 315 magnetic
	7		45	
	8		90	
	9		135	
	10		180	
	11		225	
	12		270	
	13		315	
	14	500,2000	0	set to 315 magnetic
	15		45	
	16		90	
	17		135	
	18		180	
	19		225	

Roll	Frame	Station	Azimuth	Notes
	20		270	
	21		315	
	22	500,2500	0	set to 315 magnetic
	23		45	
	24		90	
	25		135	
	26		180	
	27		225	
	28		270	
	29		315	
	30	0,2000	0	set to 225 magnetic
	31		45	
	32		90	
	33		135	
	34		180	

Camera: Canon EOS 620 Tripod height=155cm Focal length 35 unless noted otherwise

Ed Roos treatment plots

RW2	11	0,0	315	0 azimuth set to 110 magnetic. Oct 1, 1996.
	12	500,0	225	
	13	500,500	135	
	14		315	
	15		45	
	16	1000,500	225	
	17	1000,1000	225	
	18		135	
	19	500,1000	135	
	20		225	
	21		315	
	22		45	
	23	500,1500	45	
	24		135	
	25		225	
	26		315	
	27	1000,1500	135	
	28		225	
	29	1000,2000	135	
	30		225	
	31	500,2000	45	camera 2m N of post to avoid mesquite
	32		135	
	33		225	
	34		315	
	35	500,2500	45	
	36		135	
ER	1		225	Film: Kodak Gold 200 Color
	2		315	
	3	1000,2500	135	camera 2m N of post to avoid gully
	4		225	

Roll	Frame	Station	Azimuth	Notes
	5	1000,3000	135	camera 2m N of post to avoid yucca
	6		225	
	7	1000,3500	135	0 azimuth set to high point on E skyline
	8	500,3500	45	
	9	500,3000	45	
	10		135	
	11		315	
	12	0,3000	45	
	13	0,2500	45	
	14		315	
	15	0,2000	45	
	16		315	
	17	0,1500	45	
	18		315	
	19	0,1000	45	
	20		315	
	21	0,500	45	
	22		315	
Glenn Ranch treatment plots				
WG	1	0,1000	135	0 azimuth=205 magnetic. Film: Kodak Gold 100 Color.
	2		45	
	3	0,1500	45	camera moved 1m N to avoid brush
	4		135	
	5	0, 2000	135	
	6	500,2000	135	
	7		225	
	8	500,1500	45	
	9		135	
	10		225	
	11		315	
	12	500,1000	45	
	13		135	
	14		225	
	15		315	
	16	500,500	45	camera moved 1m E to avoid mesquite
	17		135	
	18		225	
	19		315	
	20	1000,500	45	
	21		135	
	22		225	
	23		315	
	24	1000,1000	45	Date: Oct 15, 1996
	25		135	
	26		225	
	27		315	
	28	1000,1500	45	

Roll	Frame	Station	Azimuth	Notes
	29		135	
	30		225	
	31		315	
	32	1000,2000	135	
	33		225	
	34	1500,2000	225	
	35	1500,1500	225	
	36		315	
WG2	1	1500,1000	225	camera moved 1m W to avoid brush
	2		315	Film: Kodak Gold 100
	3		315	repeat of frame 2
	4	1500,500	225	
	5		315	
	6	1500,0	315	
	7	1000,0	45	camera moved 1m S to avoid brush
	8		315	
	9	500,0	45	
	10		315	
	11	0,0	45	
	12	0,500	45	camera moved 2m W to avoid mesquite
	13		135	
San Bernardino Refuge plots				
	14	0,0	225	0 azimuth = 205 magnetic
	15	0,500	225	
	16		315	
	17	500,500	45	
	18		135	
	19		225	
	20		315	
	21	500,1000	45	
	22		135	
	23		225	
	24		315	
	25	0,1000	225	
	26		315	
	27	0,1500	225	
	28		315	
	29	500,1500	45	
	30		135	
	31		225	
	32		315	
	33	500,2000	45	
	34		135	
	35		225	
	36		315	
SB	1	0,2000	225	Film: Kodak Gold 100
	2		315	

Roll	Frame	Station	Azimuth	Notes
	3	0, 2500	225	
	4		315	
	5	500,2500	45	
	6		135	
	7		225	
	8		315	
	9	0,3000	315	
	10	500,3000	45	
	11		315	
	12	1000,3000	45	
	13	1000,2500	45	camera moved 2m S to avoid whitethorn
	14		135	
	15	1000,2000	45	
	16		135	
	17	1000,1500	45	
	18		135	
	19	1000,1000	45	
	20		135	
	21	1000,500	45	
	22		135	
	23	1000,0	135	
	24	500,0	135	
	25		225	
McDonald Ranch treatment plots				
GM	23	M4N	135	0 azimuth = 8 magnetic
	24	M4E	225	
	25	M4W	45	
	26	M4S	315	
	27	M3S	315	
	28	M3W	45	
	29	M3N	135	
	30	M3W	45	
	31	M3E	225	
	32	M3E	225	repeat of frame 31
	33	M2S	315	
	34	M2E	225	camera moved 5m W to avoid brush
	35	M1S	315	camera moved 5m W to avoid brush
	36	M1W	45	
MD	1	M2N	135	camera moved 2m S to avoid brush
	2	M1N	135	
	3	M1E	225	
	4	M5W	45	0 azimuth = 33 magnetic (towards peak to N)
	5	M5N	135	
	6	M5E	225	
	7	M5S	315	

Includes all those species found in P. Sundt's monitoring plots from 1993 to date (Jan. 1997). Authorities various, principally Kearney & Peebles, Arizona Flora, Gould, Grasses of southwestern United States, Benson & Darrow, Trees and Shrubs of the Southwestern Deserts, Benson, Cacti of Arizona, Martin et al, Fall Wildflowers of New Mexico, and Allred, Field Guide to the Grasses of New Mexico. Nomenclature is probably archaic in many cases Thanks for help in identification to R.M. Turner, M. Quinn, R. Felger, P. Warren, R. Van Devender.

Field Code	Common name	Scientific name
ABUT		Abutilon sp
ACA SP		Acalypha sp
ACAN	Fern acacia	Acacia angustissima
ACCO	Whitethorn	Acacia constricta
ACMI		Acacia millefolia
ACOU	Desert holly	Acoutria sp
AGAVE	Century plant, mescal	Agave sp
AGPA		Agave palmeri
AGSC		Agrostis scabra
ALIN		Allionia incarnata
ALLIUM	Wild onion	
ALOYSIA	Aloysia	Aloysia sp
AMARANTH		Amaranthus sp
AMBRO		Ambrosia sp
AMBROSIA	perennial ragweed	Ambrosia sp
ANN ARIS		Aristida adscensionis
ANN BOUTELOUA		Bouteloua barbata
ANN ERAGROSTIS		Eragrostis pectinacea
ANN FLUFFGRASS		Munroa squarrosa
ANN FUZZGRASS		
ANN NEEDLE		Bouteloua aristidioides
ANN PANICUM		Panicum arizonica
ARABIS		Arabis perennans
ARFR		Artemisia frigida
ARIS	Three awn grasses	Aristida spp
ART SP		Artemisia filifolia
ASCLEP		Asclepias sp
ASHI		Aspicarpa hirtella
ASTER		Aster sp
ASTRAG		Astragalus spp
ATCA	Fourwing saltbush	Atriplex canescens
ATRIPLEX	Fourwing saltbush	Atriplex canescens
AYFI		Ayenia filiformis
BAAB		Bahia absinthifolia
BACCH		Baccharis sp
BACCHARIS (RW2)		Baccharis pteronioides
BAGL	Seepwillow	Baccharis glutinosa
BAHIA		Bahia absinthifolia
BAILEYA	Baileya	Baileya multiradiata
BAPT	Yerba de pasmo	Baccharis pteronioides

BARREL	Barrel cactus	
BASA	Desert broom	Baccharis sarothroides
BEANVINE 1		Macroptilon sp
BERMUDA	Bermuda grass	Cynodon dactylon
BOBA	Cane beardgrass	Bothriochloa barbinodis
BOCH	Sprucetop grama	Bouteloua chondrosioides
BOCO		Boerhaavia coccinea
BOCU	Sideoats grama	Bouteloua curtipendula
BOER	Black grama	Bouteloua eriopoda
BOGR	Blue grama	Bouteloua gracilis
BOHI	Hairy grama	Bouteloua hirsuta
BOMELIA	Chittum wood	Bumelia lanuginosa
BORA	Purple grama	Bouteloua radicosa
BORAD	Purple grama	Bouteloua radicosa
BOU SP		Bouteloua barbata
BOUARI		Bouteloua aristidioides
BRDE		Brayulinea densa
BRICK		Brickellia sp
cf BRICKELLIA (RW3)		Trixis californicus
BROM		Bromus sp
BROMUS		Bromus sp
BUDA	Buffalograss	Buchloe dactyloides
CABA	Locoweed	Cassia bauhinioides
CAER	Fairyduster	Calliandra eriophylla
CARE		Calliandra cf reticulata
CASSIA		Cassia wrightii
CAST		Castilleja sp
CEMO	Mountain mahogany	Cercocarpus montanus
CERE	Net leaf hackberry	Celtis reticulata
CHLI	Desert willow	Chilopsis linearis
CHNA	Rabbitbrush	Chrysothamnus nauseosus
CHVI		Chloris virgata
CODI	Dayflower	Commelina dianthifolia
CONDALIA		Condalia sp
CORY		Coryphantha sp
CORYPHANTHA		Coryphantha sp
CRCO	Croton	Croton corybulosus
CREEP		Erigeron flagellaris
CREO	Creosote bush	Larrea tridentata
CRINKLE LF		Chamaesaracha coronopus
CRUCIFER		unknown Cruciferae
CYDA	Bermuda grass	Cynodon dactylon
DALEA		Dalea sp
DAPO		Dalea pogonothera
DAPU		Dasyochloa pulchella
DATURA	Jimson weed	Datura sp
DAWH	Sotol	Dasylirion wheeleri
DAWI		Dalea wislizenii

DAWR		Dalea wrightii
DECO		Desmanthus cooleyi
DESERTBROOM	Desert broom	Baccharis sarothroides
DICA	Arizona cottontop	Digitaria (=Trichachne) californica
DYDE		Dyschoriste decumbens
DYSP		Dyschoriste decumbens
ECFE		Echinocereus fendleri
ELAR		Elymus arizonicus
ELBA	Wooly bunchgrass	Elyonurus barbiculmis
EPHEDRA	Mormon Tea	Ephedra sp
EPTO		should be EPTR
EPTR		Ephedra trifurca
ERAN		Eriogonum annuum
ERCI		Eragrostis cilianensis
ERFL		Erigeron flagellaris
ERIG		Erigeron sp
ERIN	Plains lovegrass	Eragrostis intermedia
ERIO		Erioneuron(=Dasyochloa) pulchella
ERLA		Ericameria (=Haplopappus) laricifolius
ERLE	Lehmann's lovegrass	Eragrostis lehmanniana
ERSP		Ericameria sp
ERWR	Shrubby buckwheat	Eriogonum wrightii
EULA	Winterfat	Eurotia lanata
EUPHORB		unk Euphorbiaceae
EVOL		Evolvulus sp
EVSE		Evolvulus sericeus
FAPA	Apache plume	Fallugia paradoxa
FLAT SPURGE		Euphorbia sp
FORB	Annual forbs (lumped)	
FOX		Foxtail-like grass
FOURWING	Fourwing saltbush	Atriplex canescens
FRVE	Arizona ash	Fraxinus velutina
GAILL		Gaillardia sp
GAMI		Galium microphyllum
GARWR	Silktassel bush	Garrya wrightii
GASP		Gaura sp
GAURA	Gaura	Gaura sp
GERAN		Geranium-like forb
GNWR		Gnaphalium wrightii
GRAS	Annual grasses (lumped)	
GRND CHERRY	Ground cherry	Solanum
GUSA	Broom snakeweed	Gutierrezia sarothrae
HAIRY SIDA		Sida sp
HALA	Turpentine bush	Haplopappus laricifolius
HATE	Burroweed	Haplopappus (=Isocoma) tenuisectis
HECI		Helianthus ciliaris
HECO	Tanglehead	Heteropogon contortus
HEDE		Hedeoma dentatum

HEDGE	Hedgehog cactus	Echinocereus or Neolloydia sp
HIBE	Curly mesquite grass	Hilaria berlangeri
HIMU	Tobosa	Hilaria mutica
HODE	Hog potato	Hoffmansegia densa
HYMO	Burrobrush	Hymenoclea monogyra
HYWI		Hymenothrix wislizenii
IPLE		Ipomoea leptotoma
IPOM		Ipomaea sp
IPTH		Ipomaea thurberi
ISTE	Burroweed	Haplopappus (=Isocoma) tenuisectis
JAMA		Jatropha macrorhiza
JUDE	Alligator Juniper	Juniperus deppeana
JUMA	Arizona walnut	Juglans major
JUMO	Oneseed Juniper	Juniperus monosperma
JUN SP		Juniperus sp
KALLSTROEMIA		Kallstroemia sp
KOCR		Koeleria cristata
KOSP	Crucifixion thorn	Koeberlinea spinosa
KRLA		Krameria lanceolata
LARREA	Creosote bush	Larrea tridentata
LEDU	Green sprangletop	Leptochloa dubia
LIPPIA		Lippia sp
LOBO		Chamaesaracha coronopus
LOCO	Locoweed	Cassia bauhinioides
LONGLEAF		
LOOR		Lotus oroboides
LOTUS		Lotus sp
LYCIUM	Wolfberry	Lycium sp
LYPH	Wolftail grass	Lycurus phleoides
MALPIG		Aspicarpa hirtella
MALVACEAE		Hibiscus denudatus
MAMMI		Mammilaria sp
MANZ	Manzanita	Arctostaphylos pungens
MAPI		Machaeranthera pinnatifida
MARIOLA	Mariola	Parthenium incanum
MATA		Machaeranthera tanacetifolius
MAUR		Maurandya sp
MAVU	Horehound	Marrubium vulgare
MELE		Melampodium leucanthum
MESC		Menodora scabra
MIBI	Catclaw mimosa	Mimosa biuncifera
MIDY	Velvet pod mimosa	Mimosa dysocarpa
MUAR	Sand muhly	Muhlenbergia arenicola
MUEM	Bullgrass	Muhlenbergia emersleyi
MUH SP		Muhlenbergia sp
MUPO	Bush muhly grass	Muhlenbergia porteri
MURE	Mat muhly	Muhlenbergia repens
MURI	Deergrass	Muhlenbergia ridgens

cfMURIG		cf Muhlenbergia rigida
NOMI	Sacahuiste, beargrass	Nolina microcarpa
OCOTILLO	Ocotillo	Fouquiera splendens
OENO	Evening primrose	Oenothera sp
OPEN PANICLE		Panicum hirticaule
OPSPI	Cholla	Opuntia spinosior
OPULEP	Christmas cactus	Opuntia leptocaulis
OXLI		Oxybaphis linearis
OXY		Oxytropis sp
P38		unknown perennial forb
PABU		Panicum bulbosum
PAIN	Mariola	Parthenium incanum
PAN sp	Panic grass	Panicum hirticaule
PAOB	Vine mesquite grass	Panicum obtusum
PAPERFLR	Paperflower	Psilostrophe sp
PASE		Paspalum setaceum
PEFL		Petalostemum flavescens
PELI		Penstemon linarioides
PEN SP	Penstemon	Penstemon sp
PENST	Penstemon	Penstemon sp
PICE	Pinon pine	Pinus cembroides
PIDI	Pinon pine	Pinus discolor
PIFI	Pinon ricegrass	Piptochaetium fimbriatum
PIFL	Limber pine	Pinus flexilis var reflexa
PIPO	Ponderosa pine	Pinus ponderosa
PIPR		Piptochaetium pringlei
POFR	Cottonwood	Populus fremontii
POL SP		Polygonum sp
POOB		Polygala obscura
PORTULACA	Purslane	Portulaca sp
PPEAR	Prickly pear	Opuntia sp
PRGL	Mesquite	Prosopis glandulosa
PROBOSCIDEA	Devil's claw	Proboscidea sp
PRVI		Prunus virgata
PSME	Douglas fir	Pseudotsuga menziesii
PSOR		Psoralcea tenuiflora
PSTA		Psilostrophe tagetina
PURPLE LINEAR		
PURPLE TRUMPET VINE		Ipomoea leptotoma
QUAR	Arizona white oak	Quercus arizonica
QUE SP		Quercus sp
QUEM	Emory oak	Quercus emoryi
QUERCUS		Quercus sp
QUGA	Gambel oak	Quercus gambeli
QUHY	Silverleaf oak	Quercus hypoleucoides
QURU	Netleaf oak	Quercus rugosa
QUTO	Toumey oak	Quercus toumeyi
RED GLAND		Eriochloa acuminata

REED		reed
RHMI	Littleleaf sumac	Rhus microphylla
RHRA	Poison oak	Rhus radicans
RHTE		Rhyncosia texana
RHTR	Skunkbush	Rhus trilobata
ROSETTE	Rosie floret	Mollugo verticillata
RUMEX		Rumex sp
SACATON	Sacaton	Sporobolus wrightii
SAGO	Willow	Salix goodingii
cf SALVIA		cf Salvia sp
SASA	Soapberry	Sapindus saporina
SATA	Yewleaf willow	Salix taxifolia
SCBR	Burrograss	Scleropogon brevifolius
SCCI	Texas bluestem	Schizachrium cirratum
SEDGE	Sedge	
SELLOA		Selloa sp
SELO		Senecio longiloba
SEMA	Plains bristlegrass	Setaria macrostachya
SIDA		Sida sp
SIHY	Squirreltail grass	Sitanion hystrix
SILE		Sida lepidota
SINE		Sida neomexicana
SOEL	Horsenettle	Solanum eleagnifolium
SOLANACEAE	Prickly tomato	unk Solanaceae
SPCO	Spike dropseed	Sporobolus contractus
SPFL	Mesa dropseed	Sporobolus flexuosus
SPH SP	Mallow	Sphaeralcea sp
SPORO		Sporobolus sp
SPRUCETOP	Sprucetop grama	Bouteloua chondrosioides
SPSP	Mallow	Sphaeralcea sp
SPSU	Mallow	Sphaeralcea subhastata
SPWR	Sacaton	Sporobolus wrightii
STEPH		Stephanomeria sp
STPA		Stephanomeria pauciflorus
SYOR	Snowberry	Symphoricarpos oreophilus
TAAU		Talinum aurantiacum
TARBUSH	Tarbush	Flourensia cernua
THELO		Thelosperma megapotamicum
THMO		Thermopsis montanum
TRAGIA		Tragia sp
TRAR		Trichostemma arizonica
cf TRAR		Ayenia filiformis
TRIXIS		Trixis californicus
TRCA		Trichachne (=Digitaria) californica
TRMU		Tridens muticus
TRPI		Tradescantia pinetorum
TRPU	Fluffgrass	Tridens (=Dasyochloa) pulchella
TUMBLE		

TURPENTINE	Turpentine bush	Haplopappus laricifolius
UNID		Unidentifiable
UNKC		unknown Composite forb
UNKCSH		Unknown Composite shrub
UNKF		Unknown perennial forb
UNIF		unknown perennial forb
UNKG		Unknown perennial grass
UNKSH		Unknown shrub
UP SPURGE	upright spurge	Euphorbia sp
VEGR		Verbena gracilis
VER SP		Verbena sp
VERBENA		Verbena sp
VIAR	Grape	Vitus arizonica
WHTHORN	Whitethorn	Acacia constricta
WOODY DALEA		Dalea formosa
WOOLY	Wooly bunchgrass	Elyonuron barbiculmis
XMAS	Christmas cactus	Opuntia leptocaulis
YUBA	Spanish dagger	Yucca baccata
YUCCA		Yucca sp
YUEL	Soapweed Yucca	Yucca elata
YUSC	Mountain Yucca	Yucca schottii
ZAUS		Zauschneria sp
ZEPO		Zexmania podocephala
ZIGR	Desert zinnia	Zinnia grandiflora
ZIOB	Crucifixion thorn	Ziziphus obtusifolia

Report to the Malpai Borderlands Group:

Vegetation Monitoring of the Maverick Burn, 1996-1999

Peter Sundt
Rangeland Consultant
HC1 Box 5610, Pima, Arizona 85543

December 1, 1999

Report to the Malpai Borderlands Group:

Vegetation Monitoring of the Maverick Burn, 1996-1999

Peter Sundt
Rangeland Consultant

December 1, 1999

Introduction

The Maverick prescribed fire was conducted in the Peloncillo Mountains of southern Arizona and New Mexico in June 1997. Monitoring plots were established following the fire and sampled in fall 1997, fall 1998, and fall 1999. This report presents the data from 3 years of post-fire sampling, with a brief evaluation of the effects of the fire to date.

Methods

The sampling methods were those recommended by the Science Advisory Committee of MBG, and were consistent throughout the study period. At each plot canopy cover was estimated by the point-line intercept method, and at most plots every tree and shrub was counted. At plot 17 only Agaves were counted. To be counted as individuals, trees and shrubs of a particular species had to be separated by at least 1m. This rule was not applied to seedlings. Because of the difficulty in distinguishing fire-damaged oaks, in most plots they were lumped as *Quercus* sp. These could include *Q. toumeyi*, *Q. arizonica*, *Q. grisea* and *Q. oblongifolia*. In most cases we could identify *Q. emoryi* by its distinctive bark and leaves.

Cover data was recorded separately for each of the 10 transects in a plot. Standard errors were calculated for each species' mean estimate. For comparison among years an 80% confidence level was used. The data tables report each year's cover estimate with an associated confidence interval of 1.38 times the standard error, since the t statistic = 1.38 for 80% confidence and a sample size of 10 (Zar 1984).

Results and Discussion

The Maverick Burn has been quite successful in attaining its overall objectives, to reduce the cover of woody species and to increase perennial grasses. Table 1 summarizes the results of 3 years of post-fire sampling, and these results are presented graphically in the figures. There has been a steady, and in several cases a dramatic, increase in cover of perennial grasses. The notable exceptions are plots 19 and 20, where only a slight increase in grass cover has occurred. Both plots had dense pre-fire shrub cover, and probably around 10% cover of grass. Plot 19 is on the east side of upper Cottonwood Creek, on a steep northwest-facing slope with a dense cover of Toumey oak, Emory oak, and other shrubs. The plot had virtually no perennial grass cover in 1997 following the fire; by 1999 bull muhly, threeawn and Texas bluestem had increased to about 6% cover. Plot 20 is also in upper Cottonwood basin, on a west-facing slope with a dense pre-fire cover of manzanita and Toumey oak. This area was subjected to repeated drops of napalm and burned extremely hot. Rocks on the surface exploded, and quite possibly the soil became hydrophobic. Bare ground cover in 1997 was almost 80%; by 1999 it had dropped to about 60%, due mostly to regrowth of Toumey oak and a good crop of

annuals. There was pre-fire data for one plot, Mav14, where the cover of woody species, including mesquite, oak, juniper, mountain Yucca, and sacahuiste, was reduced from >40% to <10% by the fire. Woody cover increased slightly following the fire, due to regrowth.

Fire effects on *Agave palmeri* are of particular interest because of its role as a major nectar source for the lesser long-nosed bat, an endangered species. In 1997 I reported a 10% mortality rate for Agave averaged across all plots, calculated by dividing the number of dead, burned plants by the total of live + dead plants. As Table 2 indicates, in 1998 fewer live plants were counted in all but one plot. In my 1998 report I discussed the apparent delayed mortality of Agaves that were burned by the fire but not counted as dead in the 1997 sampling. Some of the decrease was undoubtedly due to late mortality of burned plants; mortality of senescent plants at the end of their life spans probably occurred as well. In 1999 the number of Agaves increased from 1998 in all but one plot, presumably because of recruitment of new Agaves during the wet summer. In the unburned plot Mav17 the 3 years' counts were 322, 254 and 304 individuals, or about a 20% drop between 1997-1998, and a 20% rise between 1998-1999. This year-to-year fluctuation in Agave numbers makes it difficult to assess the impact of the fire on population dynamics; the rate of Agave mortality in a fire of the type that occurred in the Maverick Burn is probably somewhere in the range of 15-25%.

Table 2. Agave density in Maverick Burn plots, 1997-1999

PLOT	1997	1998	1999
14	53	28	31
17	322	254	304
18	88	69	92
19	2	1	1
20	12	13	11
22	128	88	111
23	21	17	21
26	141	91	100
27	210	nd	151
28	193	nd	173
29	106	nd	69

The density of manzanita in upper Cottonwood basin is of interest since it was the primary target of the intense napalm drops. In 1997, immediately following the fire, only 3 manzanitas were counted in plot 20. In 1998, 4 mature plants and 382 seedlings were counted. Of those seedlings some 180 had established by fall 1999. A similar pattern occurred at plot 19, where its counts in 1997, 1998 and 1999 were 6, 73 and 103. These young plants are small and not all will survive, but undoubtedly manzanita will continue to increase in cover in this area. Future monitoring will indicate how rapidly manzanita can reclaim its former dominance.

Table 1. Summary of vegetation cover changes following the Maverick Burn, 1997-1999

PLOT	NOTES	BARE GROUND	PERENN GRASS	WOODY SPP	ANNUALS
MAV14	Pre-fire data 1996; medium intensity fire; Estes Canyon	Big increase following fire, then sharp drop 1997-99	Slight drop after fire, then steady increase 1997-99	Sharp drop after fire, then slight increase 1997-99	Steady increase, sharp in 1999
MAV17	Unburned plot, upper Cottonwood Canyon	No change	10% drop 1997-98, slight increase 1998-99	No change	Steady increase
MAV18	Medium intensity fire; near Mormon Battalion monument	No change 1997-98, sharp decrease 1998-99	Steady increase	No change	Increase 1998-99
MAV19	Medium intensity fire; upper Cottonwood, thick oak brush	Sharp decrease 1998-99	Slight increase, but very low cover, <10%	Steady regrowth	Sharp increase 1998-99
MAV20	High intensity, napalm impact site; thick manzanita	Very high (80%) post-fire, decrease to 60% by 1999	Slight increase, <10% cover	Slight increase, 10% cover	Slight increase
MAV22	Low intensity fire; upper Cottonwood basin	Steady decrease	Sharp, steady increase	Little change	Little change

PLOT	NOTES	BARE GROUND	PERENN GRASS	WOODY SPP	ANNUALS
MAV23	Medium intensity; upper Cottonwood basin	Steady decrease	Sharp, steady increase	No change	Sharp increase, 1998-99
MAV26	Low to medium intensity; steep slope with Agaves, upper Miller Spg Canyon	Steady decrease	Steady increase	Slight increase	Sharp increase
MAV27	Low intensity fire; below Cowboy Flat	Sharp decrease	Sharp increase	No change	No change
MAV28	Low intensity fire; on Cowboy Flat in Agave area	No change	Slight increase	No change	Slight increase
MAV 29	Medium intensity fire; steep slope with oaks, Cowboy Flat	Sharp decrease	Sharp increase	Slight increase	Slight increase

Sycamore Canyon Fire

A wildfire burned in Sycamore Canyon in summer 1994. Numerous photo points were established by me, by Ray Turner, and by Bill McDonald after the fire. I established two monitoring plots in 1997 adjacent to photo points to evaluate the post-fire vegetation changes. They were re-sampled in fall 1999. The data is included in the summary tables, and graphically presented in the figures. Plot McD1 is on a fairly steep west-facing slope with rocky soil and exposed bedrock. Plot McD2 is on a ridgecrest with a gentle north-facing slope, dominated by curly mesquite grass and scattered mesquite trees. Both plots showed the same basic trend observed in most Maverick Burn plots: a reduction in bare ground, an increase in perennial grass cover, and a slight increase in woody plant cover, probably due to regrowth of surviving trees.

MAVERICK BURN VEGETATION MONITORING PLOT DESCRIPTIONS

Maverick 14
The plot is on the north-facing slope directly across Estes Canyon from photo point Mav14, approx 0.2 mi upstream from confluence with Cottonwood Canyon. UTM 0681616e 3483161n. Compass bearings: E end of baseline to pillars at mouth of Estes 300 deg magnetic; w end of baseline to pillars 337deg; w end to photo point 003 deg; W end to nearest peak 194 deg. Slope 15-20 deg, aspect North, elev 4900 ft. The 175ft baseline runs 90 deg magnetic. Eight 200ft transects every 25 ft, sample points every 2ft (1996). Plot changed to 50m baseline with ten 100m transects, sample pts every 1m in Oct 1997. All 4 corners marked with T posts. Plot burned (medium intensity) in 1997.

Maverick 17
The plot is in the grassy flat on the west side of Geronimo Trail in upper Cottonwood Basin, about 0.2mi NE of the state line monument. UTM 0685500e 3486785n +/- 5.2m.
Slope 0-5 deg, aspect South, elev 5320ft. 100m x 100m plot, 8 transects, sample pts every 1m. Baseline runs 20 deg magnetic from S end, marked with T posts at each end, far corners marked with rock caim. Plot did not burn 1997.

Maverick 18
The plot is on the steep slope on the NW side of the Mormon Battalion monument in the pass at the head of Cottonwood basin. UTM 0686382e 3487702n +/- 4.2m. Slope 20-25 deg, aspect southeast, elev 5900ft. 50m x 50m plot, 10 transects, sample pts every 50cm. Baseline parallels fence (328 deg magnetic), marked with T posts at each end, transects run along contour to west, far corners marked with rock cairns. Medium intensity fire 1997.

Maverick 19
The plot is on a bench above Cottonwood Creek across the creek from the turnout about 0.5mi NE of the state line monument. UTM 0685743e 3486741n +/- 5.0m. Slope 5-10 deg, aspect west, elevation 5360ft. 50m x 50m plot, 10 transects run uphill, sample pts every 50cm, all 4 corners marked with T posts. Baseline runs 188 deg magnetic, along lower contour of plot. Medium-high intensity fire 1997.

Maverick 20
The plot is on a SW-facing slope approx. 0.3mi E of the turnout on Geronimo Trail described above. UTM 0685979e 3486612n +/- 4.9m. Slope 10-15 deg, aspect southwest, elev 5500ft. 50m x 50m plot, 10 transects run uphill, sample pts every 50cm, far corners marked with rock cairns. Baseline runs 120 deg magnetic, ends marked with T posts. High intensity burn 1997.

Maverick 22
The plot is on a SW-facing slope in the upper Cottonwood basin, east of Geronimo Trail. UTM 0686071e 3486326n +/- 4.6m. Slope 5-10 deg, aspect southwest, elev 5480 ft. 50m x 50m plot, 10 transects run uphill, sample pts every 50cm, far corners marked with rock cairns. Baseline runs 140 deg magnetic, ends marked with T posts. Low intensity burn 1997.

Maverick 23
The plot is on the same slope as plot 22, about 300m downslope. UTM 0685947e 3486305n +/- 4.5m. Slope 5-10 deg, aspect southwest, elev 5440 ft. 50m x 50m plot, 10 transects run uphill, sample pts every 50cm, far corners marked with rock cairns. Baseline runs 160 deg magnetic, ends marked with T posts. Medium intensity burn 1997.

Maverick 26
The plot is on a steep slope N of a tributary of Miller Spg canyon very near the state line and adjacent to the road which leads past a wildlife water catchment. UTM 0685031e 3485370n. Slope 15-20 deg, aspect south, elev 5280ft. 50m x 50m plot, 10 transects run along the contour, sample pts every 50cm, far corners marked with rock cairns. Baseline runs 340 deg magnetic uphill, ends marked with T posts. Low to medium intensity burn 1997.

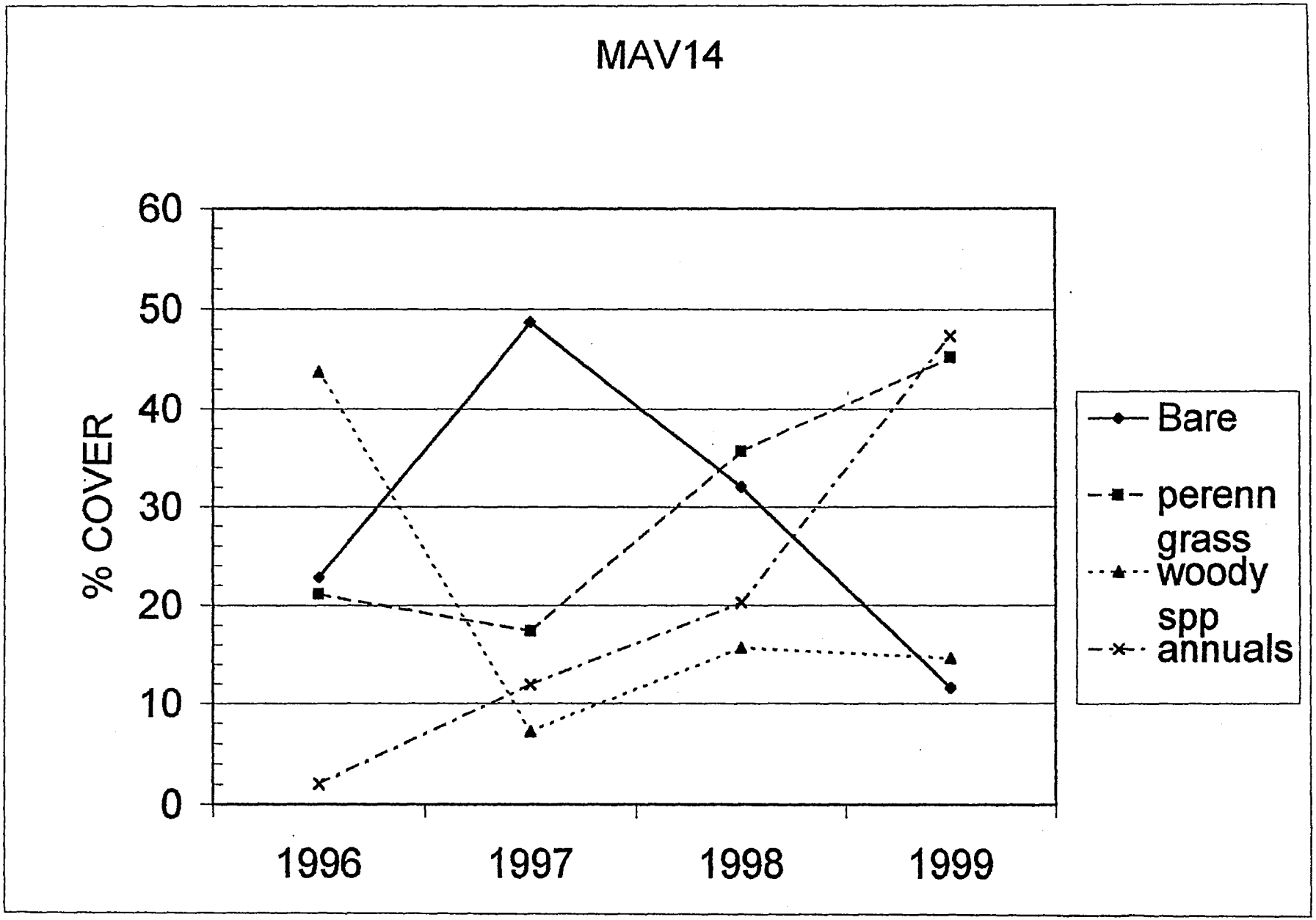
Maverick 27
The plot is along the trail from Lee Howard Spring to Cowboy Flat in upper Sycamore Canyon. UTM 0684913e 348032n +/- 4.4m. Slope 15-20 deg, aspect west, elev 5120ft. 50m x 50m plot, 10 transects run along the contour, sample pts every 50cm, far corners marked with rock cairns. Baseline runs 50 deg magnetic uphill, ends marked with T posts. Low to medium intensity burn 1997.

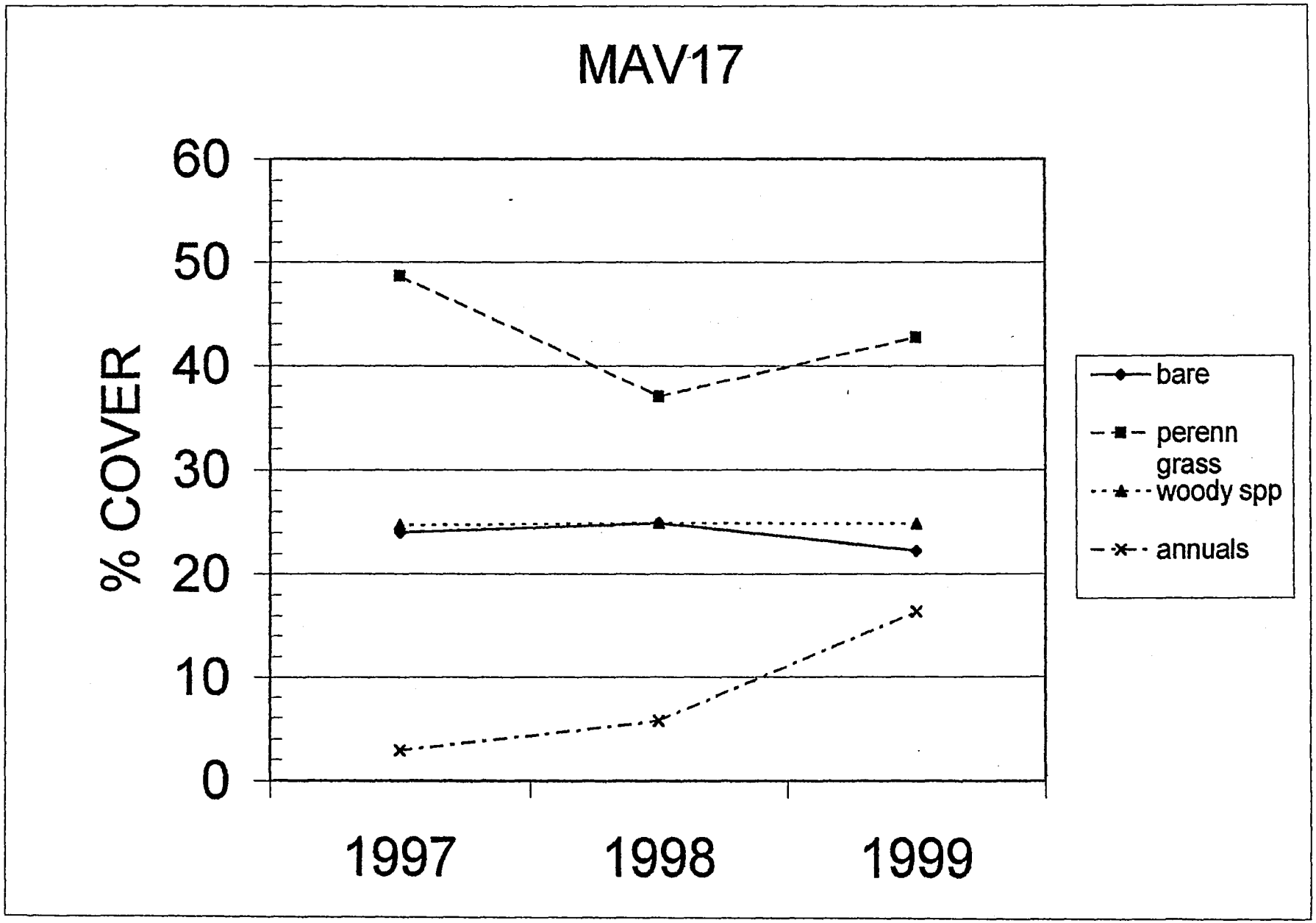
Maverick 28
The plot is on Cowboy Flat in an area of relatively dense agaves. UTM 0685153e 3480185n +/- 6.2m. Slope 0-5 deg, aspect west, elev 5220ft. 50m x 50m plot, 10 transects, sample pts every 50cm, far corners marked with rock cairns. Baseline runs 128 deg magnetic, ends marked with T posts. Only a corner of the plot burned 1997.

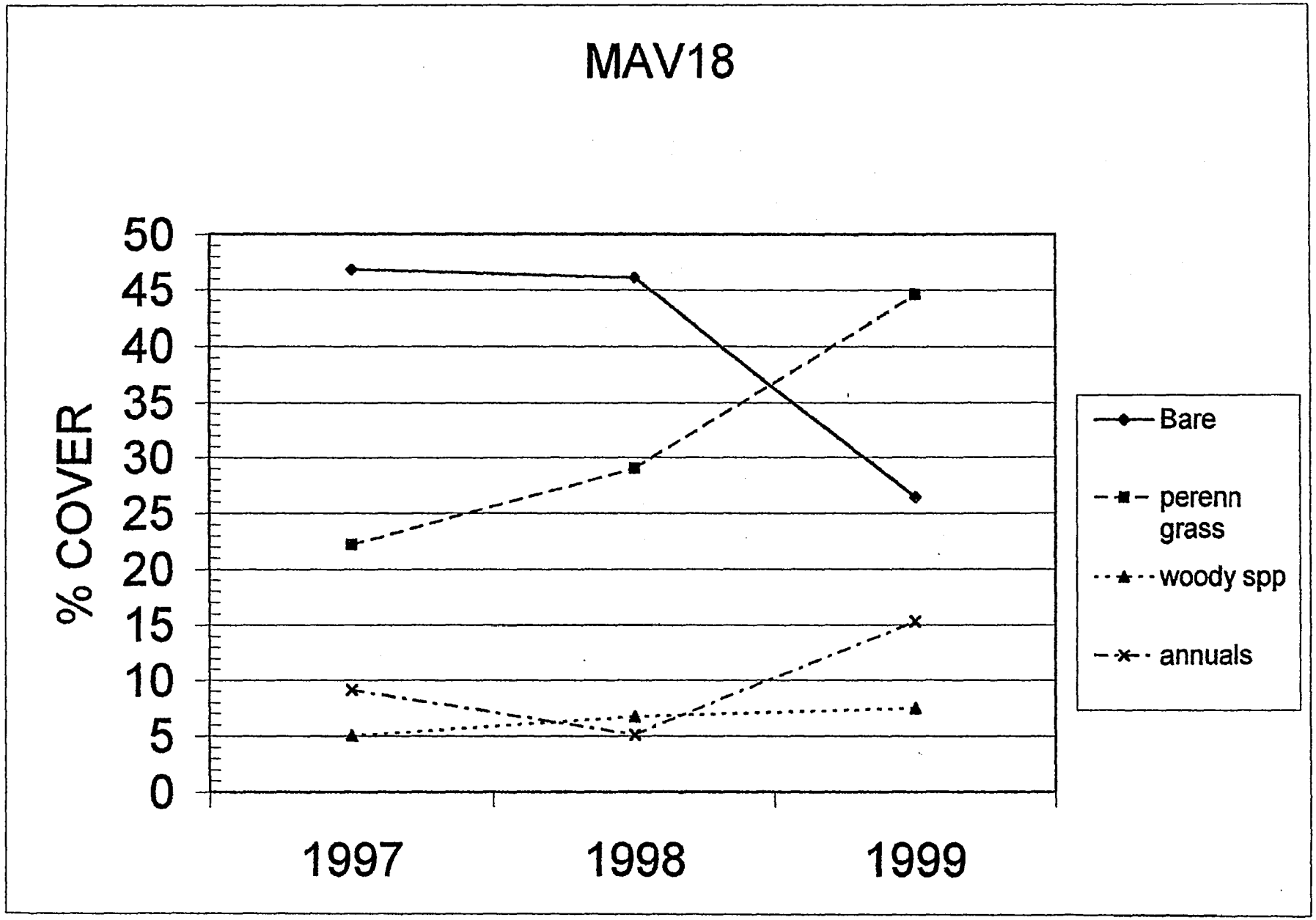
Maverick 29
The plot is on a slope on the SE edge of Cowboy Flat. UTM 0685442e 3479820n. Slope 15-20 deg, aspect west, elev 5380ft. 50m x 50m plot, 10 transects run along the contour, sample pts every 50cm, far corners marked with rock cairns. Baseline runs 64 deg magnetic uphill, ends marked with T posts. Medium intensity burn 1997.

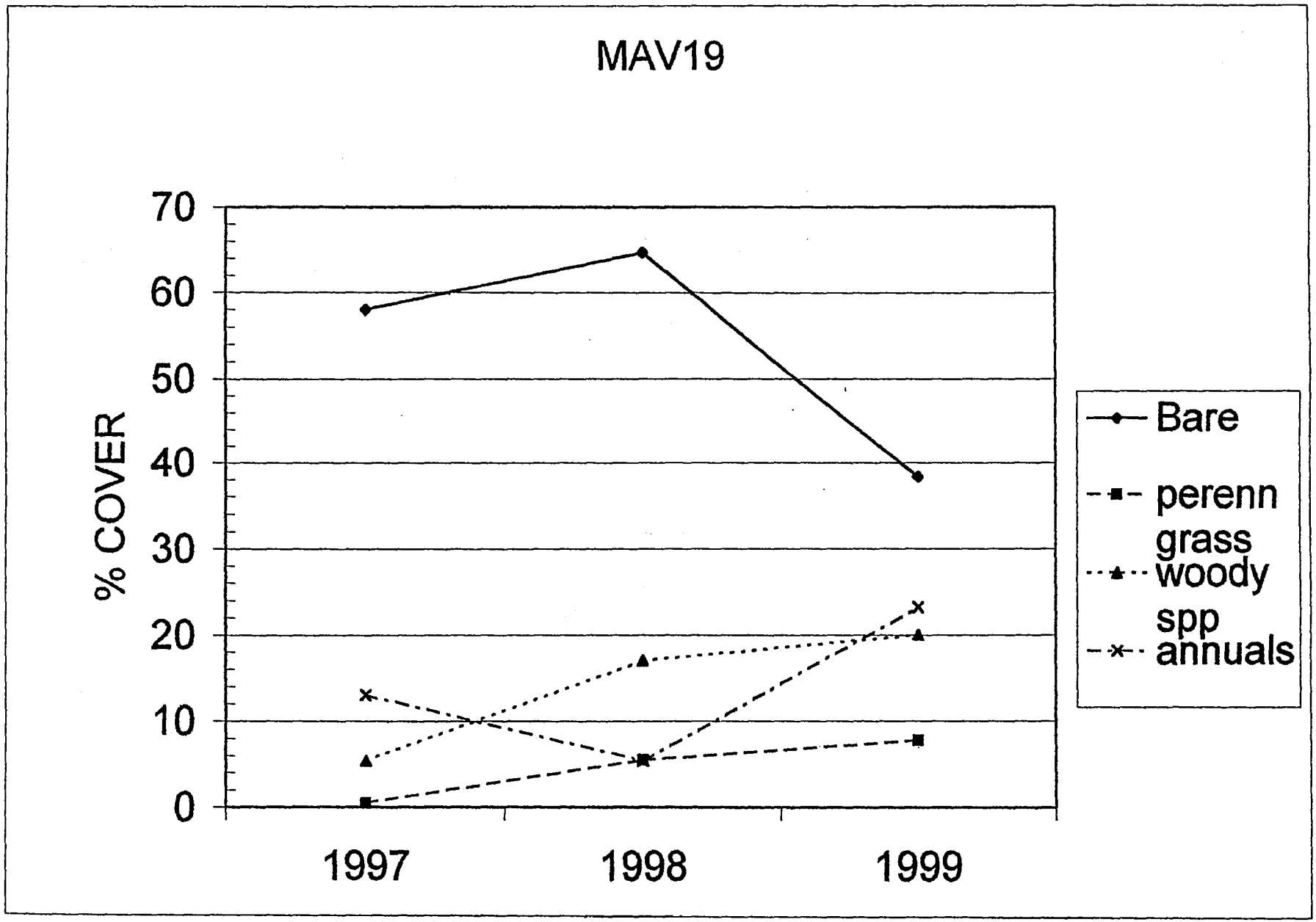
McD1
The plot is on a west-facing slope on the south side of Sycamore Canyon. UTM 0683540e 3479607n +/- 5.7m. Slope 10-15 deg, aspect west, elev 4830ft. 50m x 50m plot, 10 transects run along contour, sample pts every 50cm, far corners marked with rock cairns. Baseline runs uphill, ends marked with T posts. Plot burned in 1994 Sycamore Canyon wildfire.

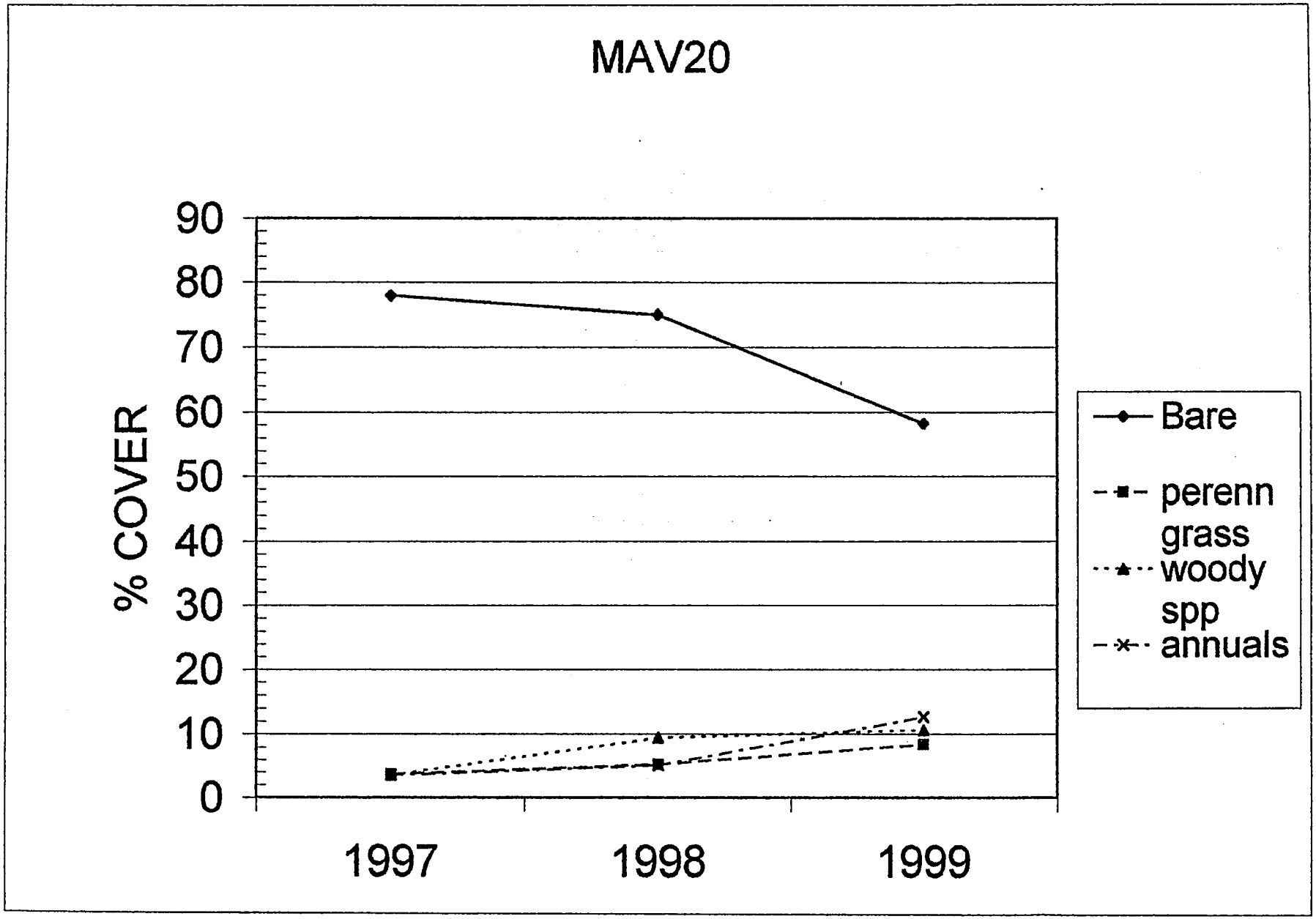
McD2
The plot is on a north-facing ridgecrest on the south side of Sycamore Canyon. UTM 0682816e 3479183n. Slope 5-10 deg, aspect north, elev 4840ft. 50m x 50m plot, 10 transects run uphill, sample pts every 50cm, far corners marked with rock cairns. Baseline ends marked with T posts. Plot burned in 1994 Sycamore Canyon wildfire.

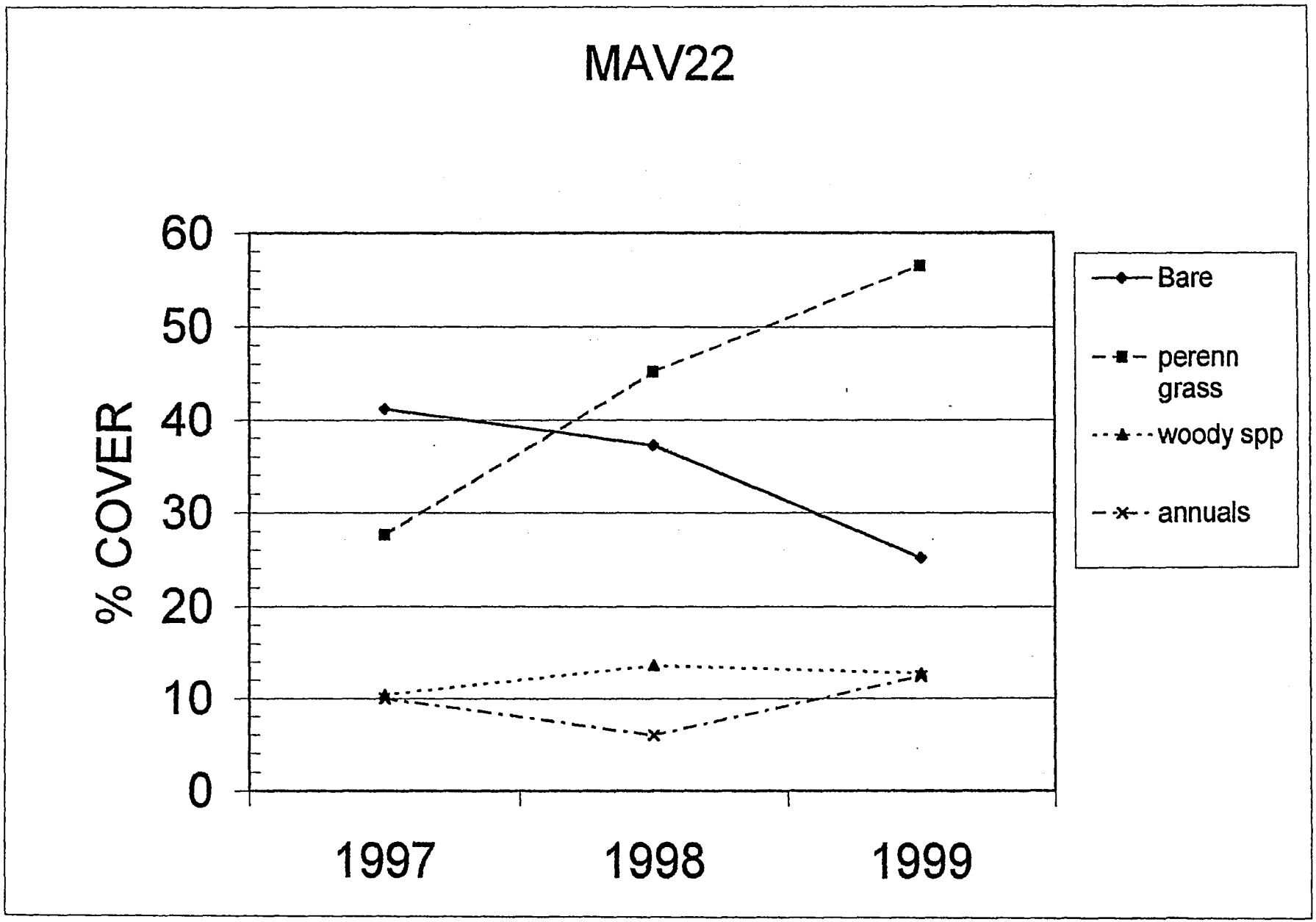

MAV14
% COVER
60
50
40
30
20
10
0
1996
1997
1998
1999
Bare
perenn grass
woody spp
annuals

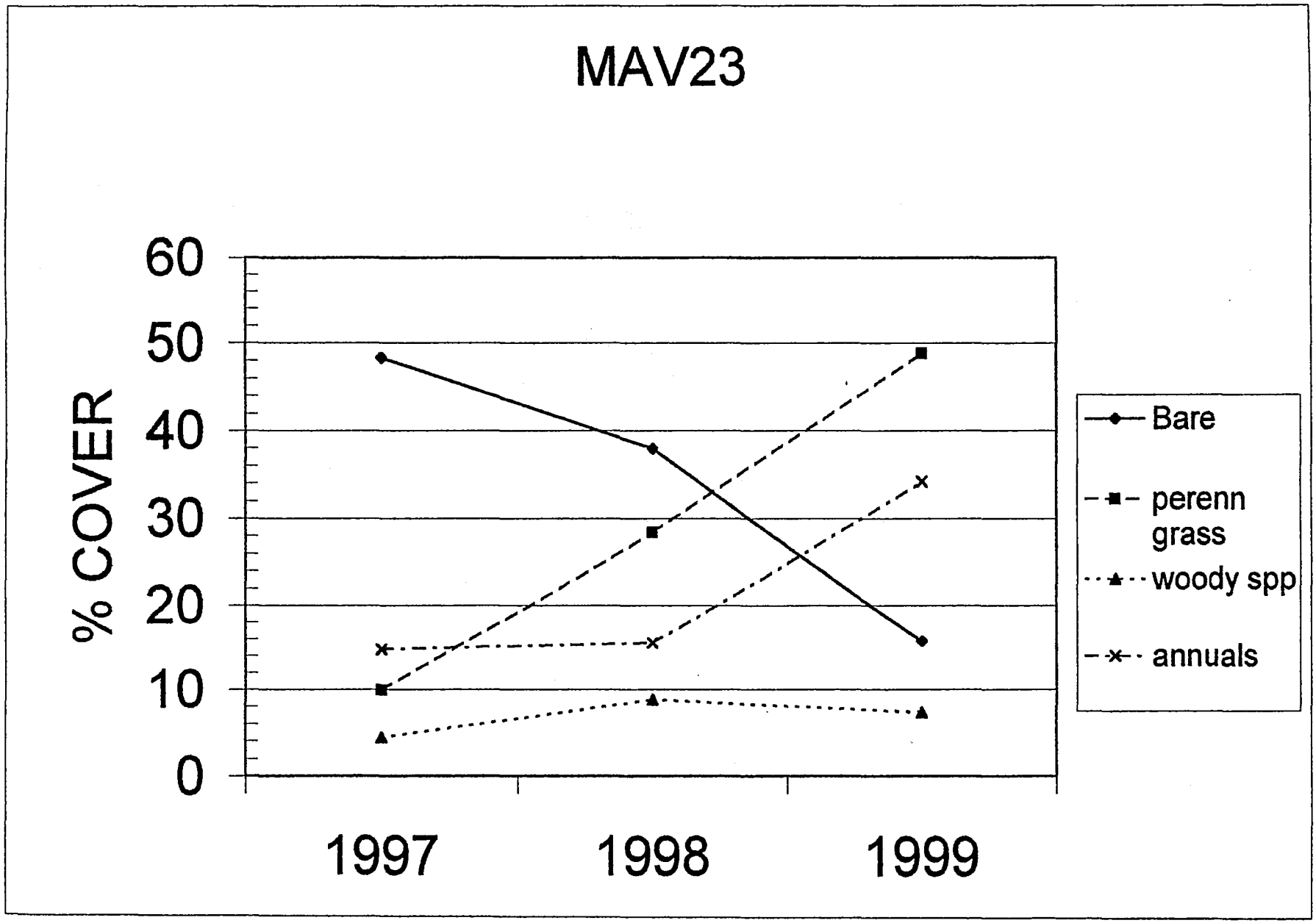

MAV17
% COVER
60
50
40
30
20
10
0
1997
1998
1999
bare
perenn grass
woody spp
annuals

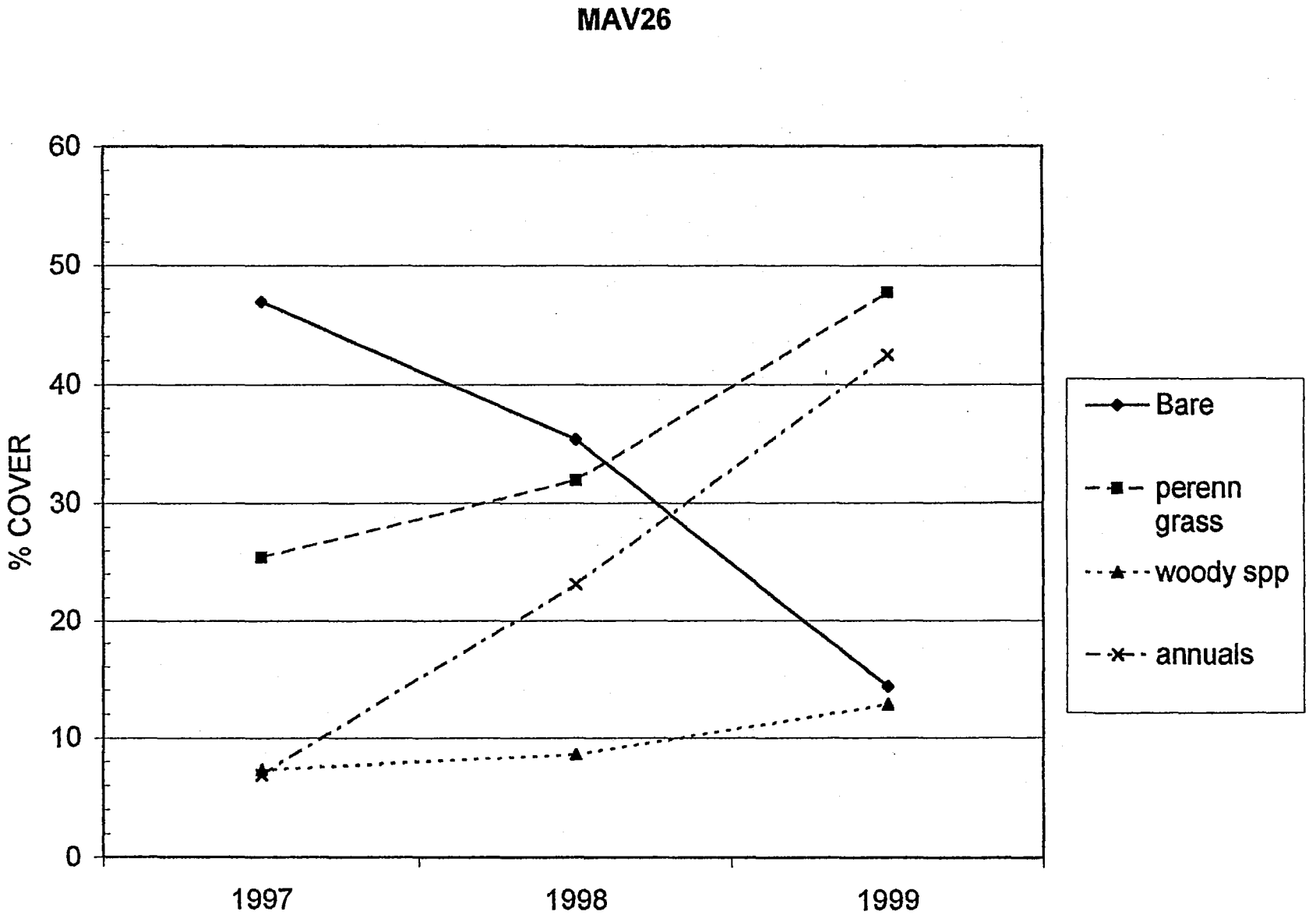

MAV18
% COVER
50
45
40
35
30
25
20
15
10
5
0
1997
1998
1999
Bare
perenn grass
woody spp
annuals

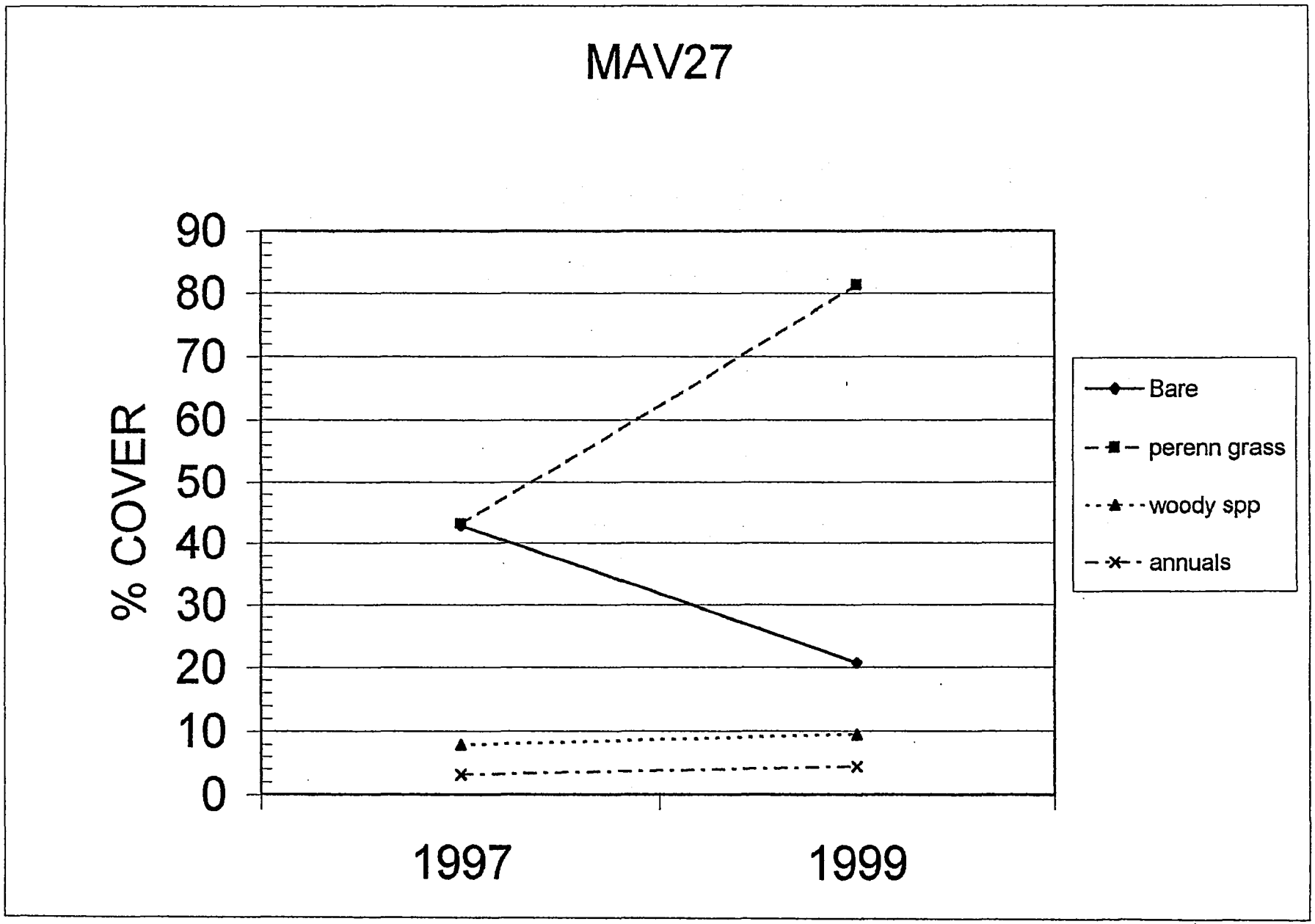

MAV19
% COVER
70
60
50
40
30
20
10
0
1997
1998
1999
Bare
perenn grass
woody spp
annuals

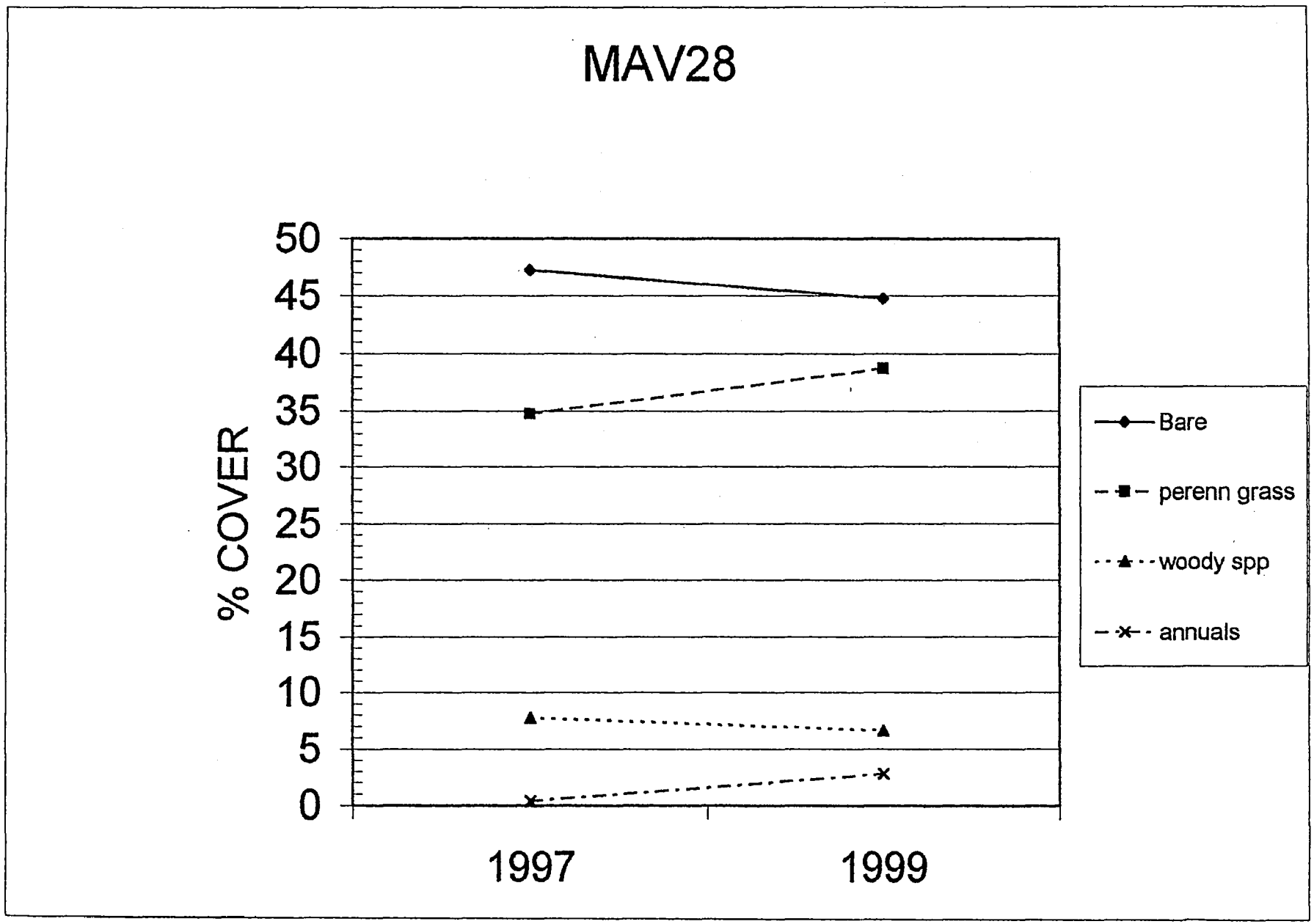

MAV20
% COVER
90
80
70
60
50
40
30
20
10
0
1997
1998
1999
Bare
perenn grass
woody spp
annuals

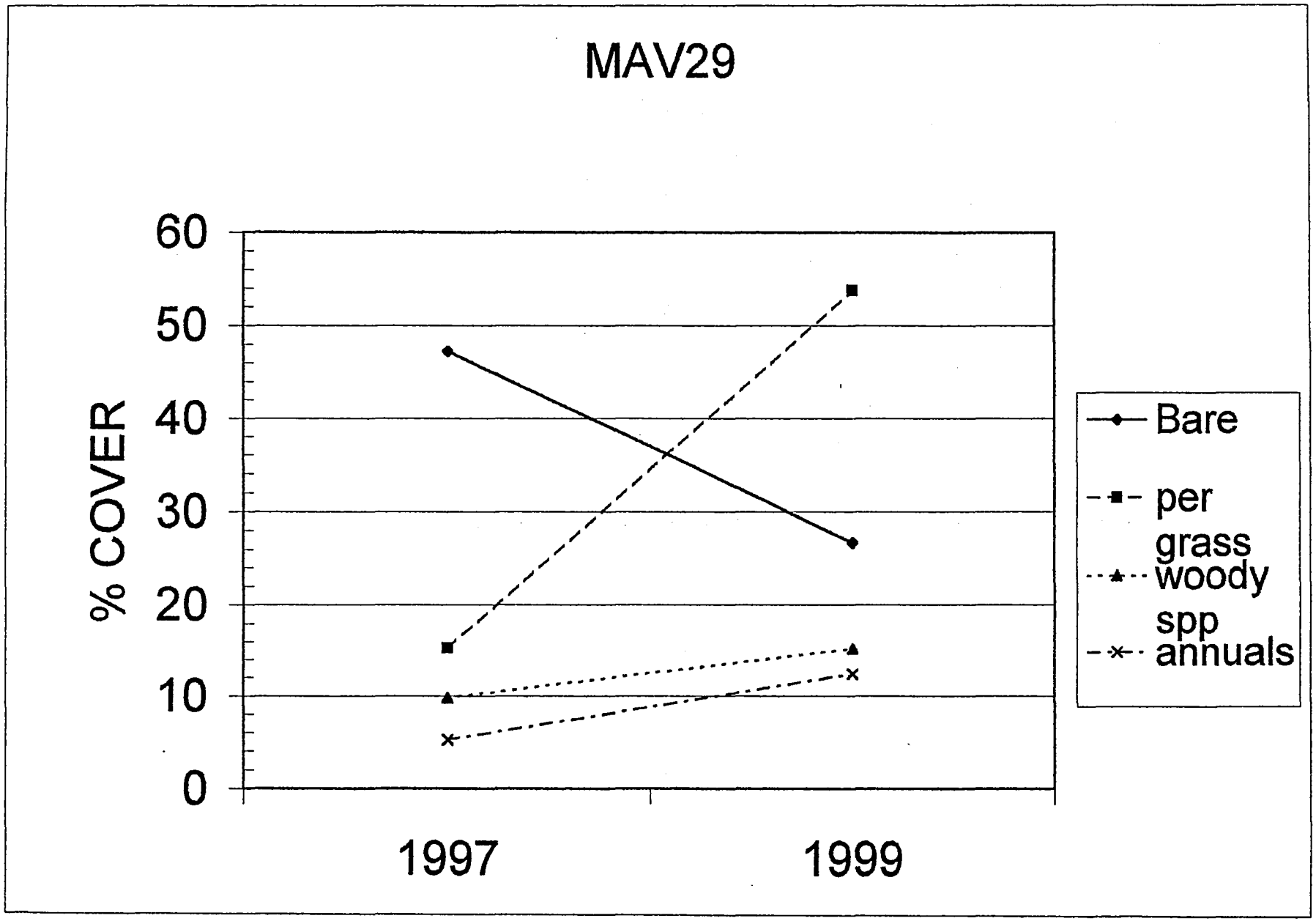

MAV22
% COVER
60
50
40
30
20
10
0
1997
1998
1999
Bare
perenn grass
woody spp
annuals

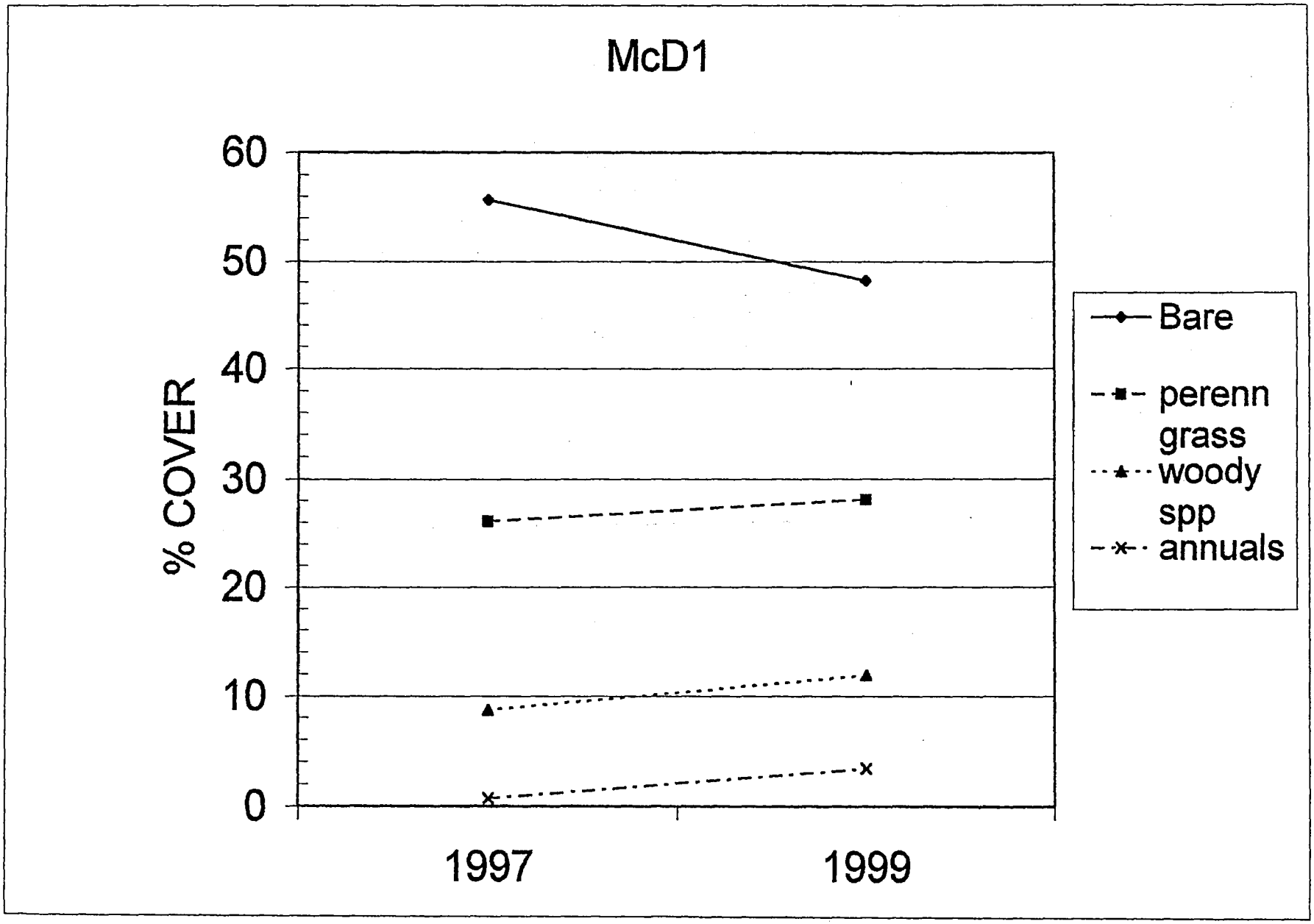

MAV23
% COVER
60
50
40
30
20
10
0
1997
1998
1999
Bare
perenn grass
woody spp
annuals

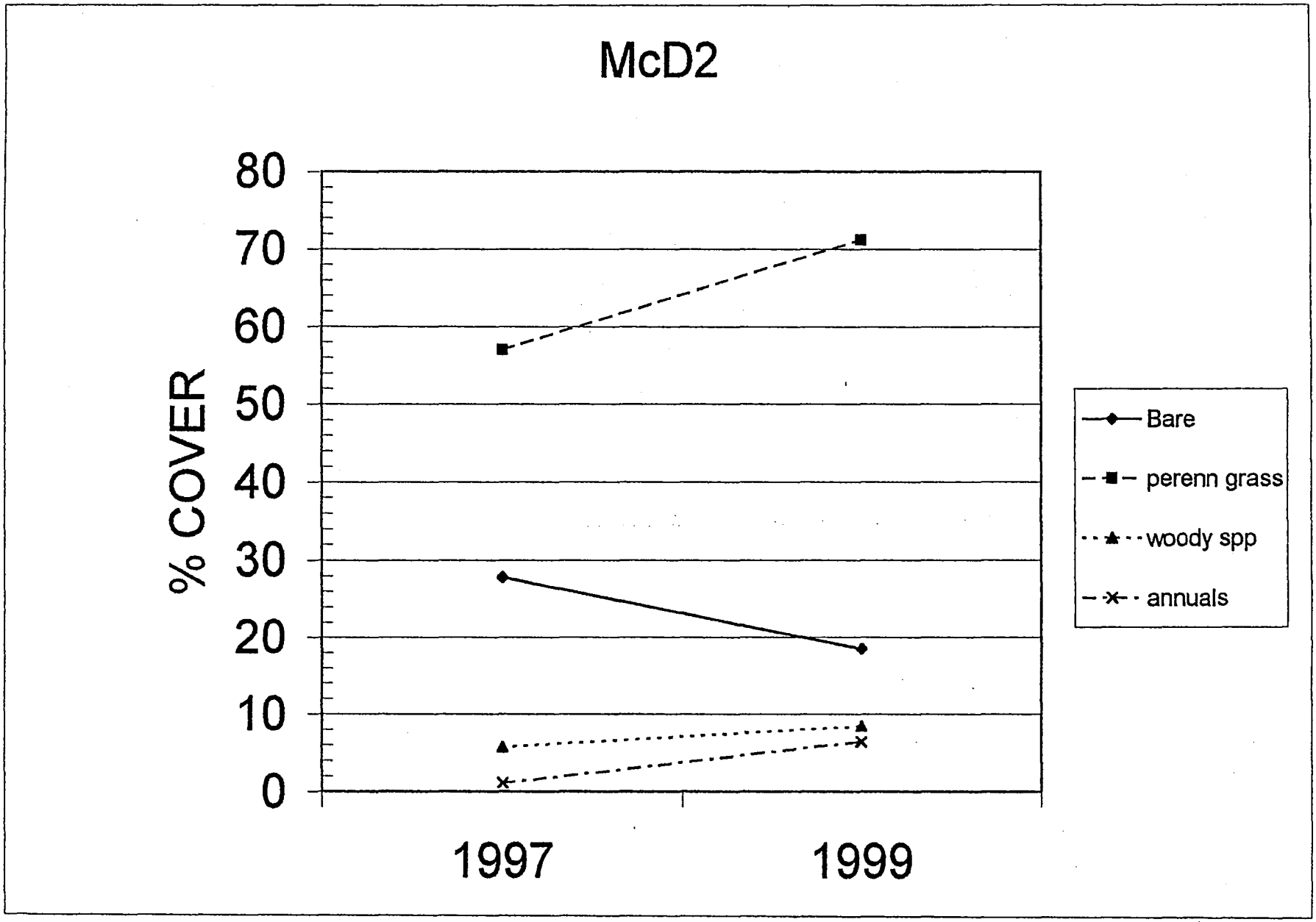

MAV26
60
50
40
30
20
10
0
% COVER
1997
1998
1999
Bare
perenn grass
woody spp
annuals


MAV27
% COVER
90
80
70
60
50
40
30
20
10
0
1997
1999
Bare
perenn grass
woody spp
annuals


MAV28
% COVER
50
45
40
35
30
25
20
15
10
5
0
1997
1999
Bare
perenn grass
woody spp
annuals


MAV29
% COVER
60
50
40
30
20
10
0
1997
1999
Bare
per grass
woody spp
annuals


McD1
% COVER
60
50
40
30
20
10
0
1997
1999
Bare
perenn grass
woody spp
annuals


McD2
% COVER
80
70
60
50
40
30
20
10
0
1997
1999
Bare
perenn grass
woody spp
annuals

PLANTS OF MAVERICK BURN MONITORING PLOTS

Authorities various, principally Kearney & Peebles, Arizona Flora, Gould, Grasses of southwestern United States, Benson & Darrow, Trees and Shrubs of the Southwestern Deserts, Benson, Cacti of Arizona, Martin et al, Fall Wildflowers of New Mexico, and Allred, Field Guide to the Grasses of New Mexico. Nomenclature is probably archaic in many cases

Thanks for help in identification to R.M. Turner, M. Quinn, R. Felger, P. Warren, R. Van Devender.

Field Code	Common name	Scientific name
ACAN	Fern acacia	Acacia angustissima
ACCO	Whitethorn	Acacia constricta
ACMI		Acacia millefolia
ACOU	Desert holly	Acoutria sp
AGAVE	Century plant, mescal	Agave sp
AGROSTIS	Bentgrass	Agrostis sp
AGPA		Agave palmeri
ALLIUM	Wild onion	Allium sp
ARAR	Madrone	Arbutus arizonica
ARIS	Three awn grasses	Aristida spp
AROR	Bentawn, beggartick	Aristida orcuttiana
ART SP		Artemisia filifolia
ASCLEP	Milkweed	Asclepias sp
ASTER	Aster	Chaetapappa ericoides
ASTRAG		Astragalus spp
ATCA	Fourwing saltbush	Atriplex canescens
AYFI		Ayenia filiformis
BAAB		Bahia absinthifolia
BAGL	Seepwillow	Baccharis glutinosa
BAHIA		Bahia absinthifolia
BAILEYA	Baileya	Baileya multiradiata
BAPT	Yerba de pasmo	Baccharis pteronioides
BARREL	Barrel cactus	
BASA	Desert broom	Baccharis sarothroides
BEANVINE		Unknown legume vine
BOBA	Cane beardgrass	Bothriochloa barbinodis
BOCH	Sprucetop grama	Bouteloua chondrosioides
BOCO		Boerhaavia coccinea
BOCU	Sideoats grama	Bouteloua curtipendula
BOER	Black grama	Bouteloua eriopoda
BOGR	Blue grama	Bouteloua gracilis
BOHI	Hairy grama	Bouteloua hirsuta
BORAD	Purple grama	Bouteloua radicosa
BRDE		Brayulinea densa
BRICK		Brickellia sp
BROMUS		Bromus sp
CABA	Locoweed	Cassia bauhinioides
CAER	Fairyduster	Calliandra eriophylla
CARE	Calliandra	Calliandra cf reticulata
CASSIA		Cassia wrightii

PLANTS OF MAVERICK BURN MONITORING PLOTS

CEMO	Mountain mahogany	Cercocarpus montanus
CERE	Net leaf hackberry	Celtis reticulata
CHLI	Desert willow	Chilopsis linearis
CHNA	Rabbitbrush	Chrysothamnus nauseosus
COCA	Coldenia	Coldenia canescens
CODI	Dayflower	Commelina dianthifolia
CONDALIA		Condalia sp
CORY		Coryphantha sp
CRCO	Croton	Croton corymbulosus
CREO	Creosote bush	Larrea tridentata
CRINKLEAWN	Crinkleawn grass	Trachypogon montufari
DALEA		Dalea sp
DAFO	Woody or feather dalea	Dalea formosa
DAPU	Fluffgrass	Dasyochloa pulchella
DATURA	Jimson weed	Datura sp
DAWH	Sotol	Dasylirion wheeleri
DECO		Desmanthus cooleyi
DICA	Arizona cottontop	Digitaria (=Trichachne) californica
DYDE		Dyschoriste decumbens
ELAR		Elymus arizonicus
ELBA	Wooly bunchgrass	Elyonurus barbiculmis
EPHEDRA	Mormon Tea	Ephedra sp
ERCU	Weeping lovegrass	Eragrostis curvula
ERFL		Erigeron flagellaris
ERIG		Erigeron sp
ERIN	Plains lovegrass	Eragrostis intermedia
ERLE	Lehmann's lovegrass	Eragrostis lehmanniana
ERWR	Shrubby buckwheat	Eriogonum wrightii
EULA	Winterfat	Eurotia lanata
EVOL		Evolvulus sp
EYSENHARDTIA	Kidneywood	Eysenhardtia polystachya
FAPA	Apache plume	Fallugia paradoxa
FORB	Annual forbs (lumped)	
FRVE	Arizona ash	Fraxinus velutina
GAILL		Gaillardia sp
GARRYA	Silktassel bush	Garrya wrightii
GAURA	Gaura	Gaura sp
GRAS	Annual grasses (lumped)	
GUSA	Broom snakeweed	Gutierrezia sarothrae
HALA	Turpentine bush	Haplopappus laricifolius
HECI		Helianthus ciliaris
HECO	Tanglehead	Heteropogon contortus
HEDGEHOG	Hedgehog cactus	Echinocereus or Neolloydia sp
HIBE	Curly mesquite grass	Hilaria berlangeri
HIMU	Tobosa	Hilaria mutica
HODE	Hog potato	Hoffmansegia densa
HYAT	Purple	Hybanthus attuenuatus

PLANTS OF MAVERICK BURN MONITORING PLOTS

HYMO	Burrobrush	Hymenoclea monogyra
ISTE	Burroweed	Haplopappus (=Isocoma) tenuisectis
JUDE	Alligator Juniper	Juniperus deppeana
JUMA	Arizona walnut	Juglans major
JUMO	Oneseed Juniper	Juniperus monosperma
JUN SP		Juniperus sp
KOCR	Junegrass	Koeleria cristata
KOSP	Crucifixion thorn	Koeberlinea spinosa
KRLA		Krameria lanceolata
LARREA	Creosote bush	Larrea tridentata
LEDU	Green sprangletop	Leptochloa dubia
LIPPIA		Lippia sp
LOCO	Locoweed	Cassia bauhinioides
LOTUS		Lotus sp
LYCIUM	Wolfberry	Lycium sp
LYPH	Wolftail grass	Lycurus phleoides
MAMMI		Mammilaria sp
MANZ	Manzanita	Arctostaphylos pungens
MAPI		Machaeranthera pinnatifida
MARIOLA	Mariola	Parthenium incanum
MATA		Machaeranthera tanacetifolius
MAVU	Horehound	Marrubium vulgare
MELE		Melampodium leucanthum
MESC		Menodora scabra
MIBI	Catclaw mimosa	Mimosa biuncifera
MIDY	Velvet pod mimosa	Mimosa dysocarpa
MUAR	Sand muhly	Muhlenbergia arenicola
MUEM	Bullgrass	Muhlenbergia emersleyi
MUH SP		Muhlenbergia sp
MUPO	Bush muhly grass	Muhlenbergia porteri
MURE	Aparejo grass	Muhlenbergia repens
MURI	Deergrass	Muhlenbergia ridgens
NOMI	Sacahuiste, beargrass	Nolina microcarpa
OCOTILLO	Ocotillo	Fouquiera splendens
OENO	Evening primrose	Oenothera sp
OPSPI	Cholla	Opuntia spinosior
OPULEP	Christmas cactus	Opuntia leptocaulis
OXY		Oxytropis sp
PAN sp	Panic grass	Panicum hirticaule
PAOB	Vine mesquite grass	Panicum obtusum
PASE		Paspalum setaceum
PEFL		Petalostemum flavescens
PENST	Penstemon	Penstemon sp
PICE	Mexican pinon pine	Pinus cembroides
PIDI	Pinon pine	Pinus discolor
PIED	Pinon pine	Pinus edulis
PIEN	Apache pine	Pinus engelmannii

PLANTS OF MAVERICK BURN MONITORING PLOTS

PIFI	Pinon ricegrass	Piptochaetium fimbriatum
PIFL	White pine	Pinus flexilis var reflexa
PILE	Chihuahua pine	Pinus leiophylla
PINON	Pinon pine	Pinus sp
PIPO	Ponderosa pine	Pinus ponderosa
PIPR		Piptochaetium pringlei
POFR	Cottonwood	Populus fremontii
POTR	Aspen	Populus tremuloides
POOB		Polygala obscura
PORTULACA	Purslane	Portulaca sp
PPEAR	Prickly pear	Opuntia sp
PRGL	Honey mesquite	Prosopis glandulosa
PROBOSCIDEA	Devil's claw	Proboscidea sp
PROSOPIS	Mesquite	Prosopis sp
PRVE	Velvet mesquite	Prosopis velutina
PRVI		Prunus virgata
PSME	Douglas fir	Pseudotsuga menziesii
PSOR		Psoralcea tenuiflora
PSTA		Psilostrophe tagetina
QUAR	Arizona white oak	Quercus arizonica
QUEM	Emory oak	Quercus emoryi
QUERCUS		Quercus sp
QUGA	Gambel oak	Quercus gambeli
QUHY	Silverleaf oak	Quercus hypoleucoides
QUOB	Mex. blue oak	Quercus oblongifolia
QURU	Netleaf oak	Quercus rugosa
QUTO	Toumey oak	Quercus toumeyi
RAINBOW	Rainbow cactus	Echinocereus cf pectinatus
REED	reed	
RHMI	Littleleaf sumac	Rhus microphylla
RHCH	Evergreen sumac	Rhus choriophylla
RHRA	Poison oak	Rhus radicans
RHTE		Rhyncosia texana
RHTR	Skunkbush	Rhus trilobata
RONE	New Mexico locust	Robinia neomexicana
RUMEX		Rumex sp
SACATON	Sacaton	Sporobolus wrightii
SAGE	Sage	cf Artemesia sp
SAGO	Black willow	Salix goodingii
SASA	Soapberry	Sapindus saporina
SATA	Yewleaf willow	Salix taxifolia
SCBR	Burrograss	Scleropogon brevifolius
SCCI	Texas bluestem	Schizachrium cirratum
SEDGE	Sedge	Carex spp
SELLOA		Selloa sp
SELO		Senecio longiloba
SEMA	Plains bristlegrass	Setaria macrostachya

PLANTS OF MAVERICK BURN MONITORING PLOTS

SIDA		Sida sp
SIHY	Squirreltail grass	Sitanion hystrix
SILE		Sida lepidota
SINE		Sida neomexicana
SOEL	Horsenettle	Solanum eleagnifolium
SPCO	Spike dropseed	Sporobolus contractus
SPFL	Mesa dropseed	Sporobolus flexuosus
SPRUCE	Engelmann spruce	Picea engelmannii
SPRUCETOP	Sprucetop grama	Bouteloua chondrosioides
SPSP	Mallow	Sphaeralcea sp
SPH SP	Mallow	Sphaeralcea sp
SPWR	Sacaton	Sporobolus wrightii
STPA		Stephanomeria pauciflorus
SYOR	Snowberry	Symphoricarpos oreophilus
TAAU		Talinum aurantiacum
TARBUSH	Tarbush	Flourensia cernua
THELO		Thelosperma megapotamicum
TRAGIA		Tragia sp
TRAR		Trichostemma arizonica
TRIXIS		Trixis californicus
TRMO	Crinkleawn	Trachypogon montufari
TRMU		Tridens muticus
TRPI		Tradescantia pinetorum
TURPENTINE	Turpentine bush	Haplopappus laricifolius
UNKC		unknown Composite forb
UNKCSH		Unknown Composite shrub
UNKF		Unknown perennial forb
UNIF		unknown perennial forb
UNKG		Unknown perennial grass
UNKSH		Unknown shrub
VERBENA		Verbena sp
VIAR	Grape	Vitus arizonica
WHTHORN	Whitethorn	Acacia constricta
WOODY DALEA		Dalea formosa
WOOLY	Wooly bunchgrass	Elyonuron barbiculmis
XMAS	Christmas cactus	Opuntia leptocaulis
YUBA	Spanish dagger	Yucca baccata
YUCCA		Yucca sp
YUEL	Soapweed Yucca	Yucca elata
YUSC	Mountain Yucca	Yucca schottii
ZAUS		Zauschneria sp
ZEPO		Zexmania podocephala
ZIGR	Desert zinnia	Zinnia grandiflora
ZIOB	Crucifixion thorn	Ziziphus obtusifolia

SUMMARY TABLE, MAVERICK BURN 1996-1999, % COVER

MAV14	1996	1.38 s.e.	1997	1.38 s.e.	1998	1.38 s.e.	1999	1.38 s.e.
Rock	10	2.3	17.3	2.5	13.4	1.5	6.0	2.3
Rock %	43.9	0.0	35.0	3.4	43.1	4.7	52.7	12.0
Soil	12.8	1.8	31.4	1.8	18.6	3.1	5.6	2.9
Soil %	56.1	0.0	65.0	3.4	56.9	4.7	47.3	12.0
Bare	22.8	3.7	48.7	3.2	32.0	3.3	11.6	4.5
Litter	17.5	3.0	14.2	2.3	4.6	0.9	2.6	2.9
Litter %	43.4	0.0	22.5	3.1	12.6	2.5	16.0	17.7
Total live	79.4	0.0	37.1	3.4	63.4	3.6	85.8	6.5
NOMI	15.0	4.4	1.8	0.6	4.5	1.6	4.9	2.7
JUMO	9.9	4.3	3.7	1.3	5.8	1.9	5.2	7.1
PROSOPIS	9.5	2.2	0.9	0.4	3.8	0.8	3.2	3.2
HIBE	9.1	4.6	7.8	2.1	8.4	3.0	9.2	13.4
GUSA	8.4	2.2	0.1	0.1	1.0	0.5	0.8	1.7
BOCU	5.8	1.4	6.4	1.1	13.2	2.9	16.3	7.8
BOHI	2.0	0.8	0.9	0.5	5.5	1.2	6.7	3.4
Annual grass	1.4	0.6	6.6	1.3	0.0	0.0	34.6	12.9
SCCI	1.3	0.8	1.0	0.5	1.8	0.8	3.7	5.7
ARIS	1.3	1.0	0.1	0.1	2.5	0.7	3.1	4.6
QUERCUS SP	0.9	1.2	0.4	0.2	0.3	0.3	0.1	0.4
ERIN	0.8	0.6	0.3	0.4	3.0	0.9	4.6	8.6
Annual forb	0.6	0.7	5.3	1.2	20.3	3.6	12.7	4.4
MUEM	0.6	0.4	0.4	0.4	0.8	0.5	0.4	1.3
LYPH	0.1	0.1	0.1	0.1	0.0	0.0	0.5	1.2
BOBA	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.4
SOEL	0	0.0	0.5	0.4	1.1	0.8	0.7	1.5
LEDU	0	0.0	0.4	0.4	0.2	0.2	1.0	2.1
YUSC	0	0.0	0.3	0.2	0.3	0.2	0.4	1.0
AROR	0	0.0	0.2	0.3	0.0	0.0	0.0	0.0
DECO	0	0.0	0.2	0.2	0.0	0.0	0.8	1.8
BOGR	0	0.0	0.1	0.1	0.4	0.2	0.6	1.2
OPSPI	0	0.0	0.1	0.1	0.0	0.0	0.1	0.4
SEDGE	0	0.0	0.1	0.1	0.0	0.0	0.0	0.0
PAOB	0	0.0	0.1	0.1	0.0	0.0	0.0	0.0
PAN SP	0	0.0	0.1	0.1	0.2	0.2	0.1	0.4
QUEM	0	0.0	0.1	0.1	0.4	0.6	0.0	0.0
BAPT	0	0.0	0.1	0.1	0.1	0.1	0.1	0.4
SAGE	0	0.0	0.1	0.1	0.2	0.2	0.0	0.0
HIMU	0	0.0	0	0	0.1	0.1	0.0	0.0
SPFL	0	0.0	0	0	0.1	0.1	0.0	0.0
AGAVE	0	0.0	0	0	0.2	0.2	0.0	0.0
ERFL	0	0.0	0	0	0.1	0.1	0.0	0.0

SUMMARY TABLE, MAVERICK BURN 1996-1999, % COVER

MAV17	1997	1.38 s.e.	1998	1.38 s.e.	1999	1.38 s.e.
Rock hits	9.0	1.2	11.9	1.8	9.4	1.7
Rock %	39.9	5.9	49.0	8.1	43.5	7.4
Soil hits	15.0	2.9	13.0	2.4	12.9	2.2
Soil %	60.1	5.9	51.0	8.1	56.5	7.4
Bare	24.0	3.6	24.9	2.1	22.3	2.1
Litter	5.3	1.1	12.8	2.3	7.5	1.7
Litter %	18.8	3.5	33.2	4.2	25.1	4.5
Total live	70.8	3.9	62.3	3.0	70.3	2.7
BOGR	16.1	5.1	9.9	2.6	11.9	4.0
PROSOPIS	7.6	1.7	6.5	1.0	6.3	1.8
GUSA	7.1	1.7	5.6	1.2	3.9	0.8
HIBE	6.8	2.4	5.8	1.1	8.5	2.3
ERIN	6.8	2.0	2.1	0.7	2.9	1.4
TURP	6.1	2.2	5.6	1.2	7.5	2.3
BOCU	5.3	1.5	3.8	0.8	5.3	1.2
BOHI	3.9	2.4	8.2	1.6	7.9	2.5
ARIS	2.8	1.3	1.4	0.3	2.8	0.9
SCCI	2.3	1.3	2.9	1.2	2.4	1.2
Annual forb	2.1	0.6	5.2	0.9	8.5	1.7
MUEM	1.8	1.0	2.9	1.2	1.1	0.6
ACAN	1.5	0.6	0.6	0.2	3.1	1.1
NOMI	1.4	1.0	2.0	1.0	1.3	0.6
LEDU	1.4	0.6	0.0	0.0	0.1	0.2
ERWR	0.9	0.7	1.5	0.8	0.1	0.2
ANN GRASS	0.8	0.7	0.5	0.4	7.9	2.4
PAOB	0.6	0.9	0.3	0.3	0.9	0.6
PIFI	0.6	0.9	0.0	0.0	0.0	0.0
AGAVE	0.5	0.3	0.3	0.2	0.6	0.4
SIDA	0.5	0.5	0.1	0.1	0.0	0.0
BORAD	0.4	0.4	0.0	0.0	0.0	0.0
DICA	0.4	0.4	0.0	0.0	0.0	0.0
HECO	0.3	0.4	0.0	0.0	0.0	0.0
JUDE	0.1	0.2	3.2	1.6	1.3	1.4
YUSC	0.1	0.2	0.4	0.2	0.6	0.3
MIDY	0.1	0.2	0.2	0.2	0.1	0.2
TAAU	0.1	0.2	0.0	0.0	0.1	0.2
SPH SP	0.1	0.2	0.0	0.0	0.0	0.0
ERLE	0.1	0.2	0.0	0.0	0.0	0.0
PPEAR	0.1	0.2	0.1	0.1	0.0	0.0
SEDGE	0.1	0.2	0.0	0.0	0.0	0.0
MIBI	0.1	0.2	0.4	0.2	0.0	0.0
JUMO	0	0	0.4	0.4	0.3	0.3

SUMMARY TABLE, MAVERICK BURN 1996-1999, % COVER

MAV18	1997	1.38 s.e.	1998	1.38 s.e.	1999	1.38 s.e.
Rock hits	20.2	1.3	20.3	2.1	13.6	2.5
Rock %	44.2	3.5	45.1	4.2	51.2	6.1
Soil hits	26.6	2.9	25.8	4.2	12.8	2.0
Soil %	55.8	3.5	54.9	4.2	48.8	6.1
Bare	46.8	2.6	46.1	4.9	26.4	3.1
Litter hits	11.0	2.1	9.4	1.4	6.5	1.6
Litter %	18.4	3.0	17.5	3.0	20.0	4.9
Total live	42.2	3.3	44.5	4.6	67.1	3.3
Annual forb	7.7	1.1	5.1	0.9	12.7	2.4
ERIN	6.1	1.1	7.5	1.5	13.0	2.2
MUEM	5.0	0.7	6.2	1.9	8.3	1.8
ACAN	4.9	1.3	1.0	0.6	5.9	2.7
CODI	2.6	0.7	0.3	0.2	1.6	1.6
BORAD	2.5	0.8	1.6	0.8	2.4	0.9
BOGR	2.5	0.9	3.6	1.6	6.1	2.6
BOCU	2.2	0.9	4.3	1.9	7.0	2.9
NOMI	2.1	0.5	3.5	1.6	3.4	1.2
SCCI	2.0	0.8	2.1	0.6	2.4	0.9
MIDY	1.6	0.5	1.2	0.7	2.5	0.8
Annual grass	1.4	0.7	0.0	0.0	2.6	1.2
ALLIUM	0.8	0.5	0.0	0.0	0.1	0.1
BOHI	0.8	0.3	1.4	1.4	2.4	1.0
LYPH	0.7	0.6	1.5	1.0	2.1	1.0
YUSC	0.5	0.2	0.6	0.4	0.8	0.6
AGAVE	0.4	0.2	0.4	0.3	0.3	0.3
ARIS	0.4	0.2	0.8	0.5	0.9	0.5
ASTRAG	0.3	0.2	0.0	0.0	0.0	0.0
QUEM	0.3	0.3	0.8	0.7	0.1	0.1
ERWR	0.2	0.1	1.6	0.4	2.2	0.5
SEDGE	0.2	0.1	0.0	0.0	0.0	0.0
SOTOL	0.1	0.1	0.2	0.2	0.4	0.4
RAINBOW	0.1	0.1	0.0	0.0	0.0	0.0
PEFL	0	0	0.4	0.3	0.1	0.1
SAGE	0	0	1.0	0.4	1.6	0.8
SPSP	0	0	0.1	0.1	0.0	0.0
SIDA	0	0	0.1	0.1	0.0	0.0

SUMMARY TABLE, MAVERICK BURN 1996-1999, % COVER

MAV19	1997	1.38 s.e.	1998	1.38 s.e.	1999	1.38 s.e.
Rock hits	14.5	1.7	16.4	2.4	10.9	1.8
Rock %	25.0	2.6	25.4	2.9	28.8	4.6
Soil hits	43.5	2.7	48.2	3.6	27.4	3.1
Soil %	75.0	2.6	74.6	2.9	71.2	4.6
Bare	58.0	3.1	64.7	4.5	38.3	3.7
Litter hits	22.4	2.4	6.3	1.4	11.8	3.0
Litter %	28.0	3.0	9.3	2.5	22.8	5.2
Total live	19.6	2.1	29.0	3.4	49.9	4.1
Annual forb	12.1	1.2	4.8	1.8	15.4	2.3
QUERCUS	3.8	1.1	13.2	1.9	15.6	3.4
Annual grass	0.9	0.5	0.6	0.3	7.8	3.3
NOMI	0.5	0.3	1.7	0.6	1.7	0.9
ACAN	0.5	0.3	0.7	0.5	1.7	0.7
ARIS	0.3	0.2	1.8	1.0	2.3	0.8
PINON	0.3	0.3	0.6	0.8	0.0	0.0
MIDY	0.3	0.2	0.6	0.3	0.8	0.4
ERIN	0.1	0.1	0.8	0.6	1.1	1.0
MUEM	0.1	0.1	1.7	0.8	1.3	1.1
BOHI	0	0	0.6	0.5	0.2	0.3
YUSC	0	0	0.2	0.2	0.3	0.4
SCCI	0	0	0.4	0.5	2.2	0.8
RHTR	0	0	0.1	0.2	0.0	0.0
BOCU	0	0	0.2	0.2	0.4	0.3

MAV20	1997	1.38 s.e.	1998	1.38 s.e.	1999	1.38 s.e.
Rock hits	19.3	2.0	23.2	2.6	19.8	1.7
Rock %	24.8	2.2	31.0	3.6	34.1	2.5
Soil hits	58.6	3.0	51.8	3.9	38.4	3.0
Soil %	75.2	2.2	69.0	3.6	65.9	2.5
Bare	77.9	3.3	75.0	4.1	58.2	3.7
Litter hits	10.7	2.1	3.7	1.1	6.6	2.2
Litter %	12.3	2.5	4.8	1.5	10.2	3.4
Total live	11.4	1.9	21.3	3.8	35.2	3.5
Annual forb	3.5	0.5	5.0	1.8	12.7	2.4
MUEM	3.3	0.9	4.4	1.5	6.6	1.5
QUERCUS	2.3	0.9	7.6	2.8	8.0	4.6
NOMI	0.5	0.2	1.0	0.5	1.0	0.7
ACAN	0.3	0.2	0.3	0.2	1.5	0.5
DAWH	0.2	0.2	0.2	0.3	0.0	0.0
MIDY	0.2	0.1	0.1	0.1	0.1	0.1
SCCI	0.2	0.2	0.5	0.3	1.2	0.8
ERIN	0.1	0.1	0.2	0.2	0.4	0.4
BOCU	0	0	0.1	0.1	0.1	0.1
YUSC	0	0	0.3	0.2	0.0	0.0

SUMMARY TABLE, MAVERICK BURN 1996-1999, % COVER

MAV22	1997	1.38 s.e.	1998	1.38 s.e.	1999	1.38 s.e.
Rock hits	18.0	1.5	17.3	2.5	11.8	1.6
Rock %	44.2	1.9	46.8	5.3	49.3	7.2
Soil hits	23.2	2.2	19.9	2.9	13.4	3.0
Soil %	55.8	1.9	53.2	5.3	50.7	7.2
Bare	41.2	3.3	37.2	3.9	25.2	3.7
Litter hits	11.0	1.5	6.4	1.2	5.9	1.1
Litter %	21.6	4.5	15.3	3.3	17.3	4.3
Total live	47.8	4.3	56.4	3.6	69.5	4.2
Annual forb	8.2	2.0	5.0	1.6	8.8	2.2
SCCI	7.4	1.0	11.1	1.5	13.3	2.6
ERIN	5.5	1.2	14.0	2.4	16.2	2.1
BOHI	5.2	1.4	6.8	1.3	7.5	1.7
JUDE	5.0	2.1	6.7	3.7	8.3	4.3
MUEM	4.2	1.0	5.3	1.0	8.5	1.4
BORAD	3.1	1.1	2.4	1.0	3.6	1.0
ALLIUM	2.6	0.7	0.6	0.4	2.4	0.7
Annual grass	1.8	0.5	0.9	0.4	3.6	1.5
NOMI	1.6	0.5	3.0	1.1	1.7	0.7
BOCU	1.2	0.4	2.8	1.3	3.3	1.3
MIDY	0.9	0.2	0.6	0.3	0.5	0.3
QUERCUS SP	0.9	0.9	0.7	0.8	0.1	0.1
QUTO	0.6	0.6	0.0	0.0	0.7	0.8
AGAVE	0.5	0.2	0.1	0.1	1.0	0.3
PIFI	0.5	0.4	0.5	0.6	0.7	0.7
ACAN	0.4	0.2	0.1	0.1	0.0	0.0
BEANVINE	0.3	0.2	0.0	0.0	0.1	0.1
PROSOPIS	0.3	0.2	1.6	1.4	0.0	0.0
ARIS	0.2	0.2	2.2	0.5	2.0	0.6
BOBA	0.2	0.1	0.0	0.0	0.2	0.2
TURPENTINE	0.1	0.1	0.6	0.6	0.4	0.4
YUSC	0.1	0.1	0.0	0.0	0.0	0.0
SEDGE	0.1	0.1	0.0	0.0	0.0	0.0
DECO	0.1	0.1	0.0	0.0	0.3	0.2
VERBENA	0.1	0.1	0.0	0.0	0.1	0.1
LYPH	0.1	0.1	0.1	0.1	1.2	0.5
SPSP	0	0	0.1	0.1	0.0	0.0
ERWR	0	0	0.4	0.4	0.2	0.3
ASTER	0	0	0.2	0.2	0.1	0.1
MANZANITA	0	0	0.2	0.3	0.0	0.0
SIDA	0	0	0.1	0.1	0.0	0.0

SUMMARY TABLE, MAVERICK BURN 1996-1999, % COVER

MAV23	1997	1.38 s.e.	1998	1.38 s.e.	1999	1.38 s.e.
Rock hits	15.8	1.4	11.8	1.4	5.3	1.4
Rock %	33.1	2.8	32.3	3.3	33.8	3.3
Soil hits	32.5	2.7	26.1	4.5	10.4	4.5
Soil %	66.9	2.8	67.7	3.3	66.2	3.3
Bare	48.3	3.0	37.9	5.4	15.7	5.4
Litter hits	22.6	2.7	8.8	2.1	6.5	2.1
Litter %	31.6	4.4	19.6	3.8	28.3	3.8
Total live	29.1	4.4	53.3	5.3	77.8	5.3
Annual forb	13.2	2.2	14.6	3.3	26.6	3.3
MUEM	3.2	0.7	5.6	2.1	5.4	2.1
SCCI	2.3	0.6	5.8	1.9	12.0	1.9
BOCU	1.5	0.6	2.3	1.3	7.7	1.3
Annual grass	1.5	0.4	0.9	0.5	7.6	0.5
ERIN	1.3	0.3	10.5	1.6	17.5	1.6
NOMI	1.2	0.3	1.7	0.7	0.9	0.7
QUERCUS	1.1	0.8	1.7	1.5	2.3	1.5
JUDE	0.9	0.8	2.7	2.0	0.4	2.0
BOHI	0.8	0.5	1.9	1.0	2.7	1.0
ACAN	0.6	0.3	0.3	0.2	1.4	0.2
ARIS	0.4	0.2	1.5	0.8	2.5	0.8
ZEXMANIA	0.3	0.2	0.4	0.6	2.3	0.6
TURPENTINE	0.2	0.2	0.2	0.3	0.0	0.3
LONGAWN	0.2	0.2	0.0	0.0	0.0	0.0
QUEM	0.2	0.2	1.1	1.2	1.8	1.2
DECO	0.1	0.1	0.0	0.0	0.2	0.0
MIDY	0.1	0.1	0.1	0.1	0.1	0.1
CODI	0.1	0.1	0.0	0.0	0.0	0.0
AGAVE	0.1	0.1	0.0	0.0	0.0	0.0
ALLIUM	0.1	0.1	0.0	0.0	0.0	0.0
VERBENA	0.1	0.1	5.0	2.0	0.0	2.0
PIFI	0.1	0.1	0.2	0.3	0.5	0.3
LYPH	0.1	0.1	0.2	0.2	0.0	0.2
BEANVINE	0.1	0.1	0.0	0.0	0.2	0.0
MIBI	0.1	0.1	0.4	0.4	0.7	0.4
PROSOPIS	0	0	0.5	0.3	0.2	0.3
ELBA	0	0	0.1	0.1	0.3	0.1
ASTER	0	0	0.3	0.3	0.3	0.3
SEDGE	0	0	0.5	0.5	0.2	0.5
ERWR	0	0	0.4	0.4	0.3	0.4
PEFL	0	0	0.2	0.2	0.2	0.2
SAGE	0	0	0.4	0.3	0.0	0.3
LEDU	0	0	0.1	0.1	0.2	0.1
SPSP	0	0	0.6	0.6	0.0	0.6
SIDA	0	0	0.1	0.1	0.1	0.1
YUSC	0	0	0.4	0.3	0.1	0.3
CRINKLEAWN	0	0	0.1	0.1	0.0	0.1
BOGR	0	0	0.2	0.3	0.0	0.3
MIDY	0	0	0.1	0.1	0.1	0.1

SUMMARY TABLE, MAVERICK BURN 1996-1999, % COVER

MAV26	1997	1.38 s.e.	1998	1.38 s.e.	1999	1.38 s.e.
Rock hits	22.2	1.8	17.8	2.3	8.4	2.0
Rock %	47.2	2.6	51.6	4.8	57.8	6.0
Soil hits	24.7	1.9	17.6	3.4	5.9	1.2
Soil %	52.8	2.6	48.4	4.8	42.2	6.0
Bare	46.9	2.8	35.4	5.1	14.3	2.8
Litter hits	14.7	1.6	6.2	1.2	5.3	1.3
Litter %	24.3	3.8	16.3	4.0	26.2	3.7
Total live	38.4	2.9	58.4	4.6	80.4	3.6
BOCU	11.8	1.6	9.9	3.8	24.6	3.9
HIMU	6.7	1.4	18.0	5.3	11.2	3.3
Annual grass	4.4	1.0	0.0	0.0	23.9	5.6
Annual forb	2.5	0.7	23.1	3.1	18.6	3.6
LEDU	2.4	0.6	0.0	0.0	4.6	1.9
AGAVE	2.2	0.4	2.3	1.3	2.2	1.2
ACAN	1.8	0.7	0.4	0.4	3.8	1.7
SCCI	1.8	0.6	1.0	0.6	2.4	1.1
PROSOPIS	1.3	0.6	4.2	1.4	5.1	1.6
HECO	1.1	0.6	0.3	0.4	0.7	0.5
MUEM	0.8	0.4	1.1	0.8	1.2	0.5
SOTOL	0.5	0.3	0.6	0.5	0.7	0.4
JUDE	0.5	0.5	0.6	0.8	0.5	0.7
MIBI	0.5	0.5	0.3	0.4	0.2	0.3
ARIS	0.3	0.2	0.1	0.1	0.7	0.5
EYSEN	0.2	0.1	0.0	0.0	0.0	0.0
DICA	0.2	0.1	0.1	0.1	0.9	0.5
MIDY	0.1	0.1	0.0	0.0	0.0	0.0
HIBE	0.1	0.1	0.1	0.1	0.4	0.6
TURPENTINE	0.1	0.1	0.0	0.0	0.3	0.4
ERIN	0.1	0.1	0.8	0.5	0.5	0.2
CALLIANDRA	0.1	0.1	0.0	0.0	0.0	0.0
GUSA	0.1	0.1	0.0	0.0	0.0	0.0
BOBA	0.1	0.1	0.5	0.4	0.5	0.4
NOMI	0	0	0.1	0.1	0.0	0.0
OPSPI	0	0	0.1	0.1	0.0	0.0

SUMMARY TABLE, MAVERICK BURN 1996-1999, % COVER

MAV27	1997	1.38 se	1999	1.38 se
Rock	25.2	3.9	13.1	1.4
Soil	17.6	2.4	7.5	2.4
Bare	42.8	5.5	20.6	3.2
Litter	6.4	2.0	1.5	0.7
MURE	14.8	4.2	32.3	8.9
HECO	8.0	2.0	8.6	2.3
BORAD	6.7	1.6	12.1	3.3
QUERCUS SP	4.2	3.1	5.0	3.0
TRMO	3.3	1.8	6.9	2.7
SCCI	3.2	1.3	3.5	1.5
Annual grass	2.7	1.5	2.8	1.0
BOHI	2.1	1.0	6.5	1.0
AGAVE	1.9	0.8	1.5	0.4
MUEM	1.8	1.7	4.5	2.0
EYSEN	1.0	0.5	0.9	0.8
ERIN	0.9	0.4	3.3	1.5
BEANVINE	0.8	0.4	0.0	0.0
BOCU	0.7	0.4	1.5	0.6
LEDU	0.6	0.4	0.4	0.2
ACAN	0.5	0.3	1.5	0.7
AROR	0.4	0.4	0.0	0.0
MIDY	0.4	0.3	0.5	0.5
Annual forb	0.4	0.2	1.6	0.7
FERN	0.4	0.4	0.0	0.0
LYPH	0.3	0.3	0.1	0.2
ARIS	0.3	0.2	1.8	0.3
PROSOPIS	0.1	0.1	0.4	0.5
GUSA	0.1	0.1	0.1	0.2
DALEA	0.1	0.1	0.0	0.0
RAINBOW	0.1	0.1	0.0	0.0
CALLIANDRA	0.1	0.1	0.0	0.0
cf AGROSTIS	0.1	0.1	0.0	0.0
QUEM	0	0	1.1	1.4

SUMMARY TABLE, MAVERICK BURN 1996-1999, % COVER

MAV28	1997	1.38 se	1999	1.38 se
Rock hits	15.6	3.6	15.6	3.6
Rock %	33		34.9	6.5
Soil hits	32.3	2.9	29.1	3.8
Soil %	68		65.1	6.5
Bare	47.3	4.2	44.8	4.0
Litter hits	6.1	0.8	4.9	1.0
Litter %	11		10.3	2.2
Total live	47		50.4	3.6
BOHI	13.9	1.8	18.1	2.7
BORAD	6.8	1.4	4.0	1.6
MURE	5.3	1.6	7.9	2.7
GUSA	3.0	1.0	3.3	1.0
ERIN	2.4	0.8	2.0	0.7
MOSS	2.4	1.0	1.0	0.5
NOMI	1.9	1.2	1.4	1.0
BOGR	1.6	0.5	1.0	0.6
HIBE	1.5	0.9	0.0	0.0
AGAVE	1.4	0.7	1.1	0.5
LYPH	1.1	0.3	1.0	0.4
SCCI	1.0	0.6	1.3	0.4
ACAN	0.8	0.5	0.4	0.3
BOCU	0.6	0.6	0.4	0.3
BOBA	0.5	0.5	1.3	0.5
CALLIANDRA	0.4	0.2	0.0	0.0
Annual forb	0.4	0.3	2.8	0.9
ERWR	0.3	0.2	0.0	0.0
DECO	0.3	0.3	0.9	0.5
TURPENTINE	0.1	0.2	0.0	0.0
PROSOPIS	0.1	0.2	0.0	0.0
ARIS	0.1	0.2	1.9	1.3
MIBI	0.1	0.2	0.5	0.3
SIDA	0.1	0.2	0.3	0.3
CODI	0.1	0.2	0.1	0.2

SUMMARY TABLE, MAVERICK BURN 1996-1999, % COVER

MAV29	1997	1.38SE	1999	1.38SE
Rock hits	15.2	1.9	10.6	1.7
Rock %	32.2		41.0	5.9
Soil hits	32.0	3.2	16.1	2.6
Soil %	67.8		59.0	5.9
Bare	47.2	2.4	26.7	3.4
Litter hits	4.0	1.2	4.0	1.2
Litter %	7.8		12.4	2.4
Total live	48.8		69.3	4.2
SCCI	4.4	1.4	13.7	3.4
MUEM	4.1	0.9	8.5	1.4
QUERCUS	3.0	1.4	6.8	2.9
BOCU	2.8	1.2	11.2	1.8
Annual grass	2.6	1.1	7.9	1.7
Annual forb	2.6	1.0	4.5	1.3
NOMI	1.8	0.8	3.0	0.8
AROR	1.7	0.8	0.0	0.0
BOHI	1.3	0.7	4.9	1.8
QUEM	1.0	0.8	0.5	0.4
MIDY	1.0	0.3	1.5	0.6
ACAN	1.0	0.6	1.4	0.8
JUMO	0.6	0.8	0.5	0.7
BORAD	0.5	0.5	1.2	1.0
ERIN	0.4	0.2	5.1	2.0
AGAVE	0.3	0.2	0.2	0.3
HIBE	0.3	0.4	0.0	0.0
YUSC	0.3	0.3	0.6	0.4
DAWH	0.3	0.4	0.3	0.4
DAFO	0.2	0.2	0.0	0.0
GUSA	0.1	0.1	0.4	0.3
LYPH	0.1	0.1	0.6	0.3
RHCH	0.1	0.1	0.0	0.0
QUHY	0.1	0.1	0.0	0.0
BOBA	0.1	0.1	3.0	3.1
ARIS	0.1	0.1	6.8	2.2

SUMMARY TABLE, MAVERICK BURN 1996-1999, % COVER

McD1	1997	1.38 se	1999	1.38 se
Rock hits	29.4	4.3	31.5	5.0
Rock %	51.8	4.0	64.4	5.5
Soil hits	26.3	1.9	16.7	2.7
Soil %	99.0	17.0	35.6	5.5
Bare	55.7	4.3	48.2	4.8
Litter hits	11.3	1.8	7.2	1.5
Litter %	17.2	3.0	13.7	3.5
Total live	33.0	3.6	44.6	4.1
TRMO	9.1	1.8	10.8	2.2
BOHI	4.2	1.5	4.8	1.1
BOCU	4.0	2.0	2.9	1.6
BORAD	3.8	1.6	4.6	1.4
GUSA	2.7	1.9	5.8	4.0
QUEM	2.3	1.4	2.6	1.4
PROSOPIS	1.9	1.0	1.8	0.9
ARIS	1.4	0.7	0.8	0.5
ERIN	1.0	0.5	0.6	0.5
HECO	0.7	0.7	0.1	0.1
Annual forb	0.7	0.4	3.4	0.6
AGAVE	0.7	0.6	0.7	0.5
SCCI	0.5	0.6	1.7	0.9
MUEM	0.4	0.2	1.2	0.8
TURPENTINE	0.4	0.3	0.4	0.2
DALEA SP	0.4	0.3	0.7	0.4
LEDU	0.3	0.3	0.0	0.0
AROR	0.3	0.3	0.0	0.0
BOBA	0.2	0.2	0.2	0.2
YUSC	0.2	0.3	0.0	0.0
MIBI	0.2	0.3	0.2	0.2
NOMI	0.1	0.1	0.0	0.0
EYSENHARDTI	0.1	0.1	0.4	0.3
HIBE	0.1	0.1	0.3	0.4
MIDY	0.1	0.1	0.0	0.0
ELBA	0.1	0.1	0.1	0.1

SUMMARY TABLE, MAVERICK BURN 1996-1999, % COVER

McD2	1997	1.38 se	1999	1.38 se
Rock hits	7.8	2.0	6.4	1.4
Rock %	39.2	3.3	32.9	3.3
Soil hits	20.0	2.2	12.1	1.5
Soil %	73.7	3.3	67.1	3.3
Bare	27.8	5.4	18.5	5.4
Litter hits	10.2	1.7	2.8	0.6
Litter %	27.1	3.8	12.3	3.8
Total live	62.0	5.3	78.8	5.3
HIBE	41.6	3.1	51.1	4.3
BOHI	9.2	1.8	14.5	2.1
PROSOPIS	3.9	1.1	2.8	0.9
BOCU	2.9	0.8	3.6	1.2
GUSA	1.6	0.7	5.4	0.9
ERIN	1.4	0.8	0.4	0.2
ARIS	0.9	0.5	1.0	0.5
BOBA	0.7	0.4	0.5	0.2
Annual forb	0.6	0.4	0.4	0.3
Annual grass	0.5	0.6	6.0	2.7
MUEM	0.2	0.2	0.1	0.2
MIBI	0.2	0.2	0.3	0.3
DECO	0.1	0.1	1.8	0.6
DICA	0.1	0.1	0.0	0.0
ERWR	0.1	0.1	0.1	0.2
BAPT	0.1	0.1	0.0	0.0
NOMI	0.1	0.1	0.3	0.3

SUMMARY TABLE, MAVERICK BURN, 1997-1999, DENSITY (# PLANTS/PLOT)

MAV14	1997	1998	1999
NOMI	295	265	243
PROSOPIS	129	155	131
AGAVE	53	28	31
YUSC	37	35	34
OPSPI	21	15	7
JUMO	17	17	14
QUERCUS	12	9	11
MIBI	11	9	12
MIDY	6	7	5
QUEM	4	2	2
PPEAR	3	0	1
SOTOL	1	2	1
TURP	0	6	4
GARRYA	0	4	0
BAPT	0	5	2
ZIZIPHUS	0	2	1
QUOB	0	1	0
CORY	0	2	0

MAV19	1997	1998	1999
QUERCUS*	136	158	155
NOMI	85	85	75
MIDY	59	52	51
YUSC	39	44	36
PINON	19	8	2
MANZANITA	6	73	103
PPEAR	5	6	2
RHCH	3	2	2
AGAVE	2	1	1
GARRYA	2	5	5
JUDE	1	8	8
SOTOL	1	1	1
QUERC seedl	0	55	0
RHTR	0	2	2
JUNIPER seedl	0	1	0
JUNIPER SP	0	3	0
MIBI	0	2	2

MAV17	1997	1998	1999
AGAVE	322	254	304

MAV18	1997	1998	1999
NOMI	136	137	219
MIDY	131	93	177
AGAVE	88	69	92
RAINBOW	59	46	33
YUSC	34	33	38
SOTOL	18	2	24
QUEM	10	10	12
OPSPI	8	5	37
QUERCUS SP	5	9	6
TURPENTINE	3	7	19
PPEAR	3	2	2
JUNIPER SP	3	3	3
EYSENHARDTIA	2	0	4
GARRYA	1	1	2
MIBI	1	0	2
MAMMILARIA	0	1	0

MAV20	1997	1998	1999
QUERCUS	70	95	71
NOMI	47	54	48
MIDY	32	9	13
SOTOL	19	13	13
YUSC	16	20	16
AGAVE	12	13	11
MANZANITA	3	4	187
RHCH	2	1	1
MIBI	2	3	5
OPSPI	1	0	0
GARRYA	0	2	1
BAPT	0	2	1
MANZ seedl	0	382	nd
QUERC seedl	0	11	nd

SUMMARY TABLE, MAVERICK BURN, 1997-1999, DENSITY (# PLANTS/PLOT)

MAV22	1997	1998	1999
AGAVE	128	88	111
NOMI	83	86	72
MIDY	65	54	66
OPSPI	40	13	19
JUDE	21	20	20
TURPENTINE	15	15	8
QUEM	14	12	25
QUERCUS SP	9	12	0
YUSC	6	6	6
QUTO	5	3	5
BAPT	4	8	8
PROSOPIS	4	8	9
PPEAR	3	3	3
RAINBOW	3	1	0
MANZANITA	3	3	3
CORY	3	5	4
DAWH	2	1	2
PINON	1	2	1
GUSA	1	0	nd
MIBI	1	2	1
HEDGEHOG	1	1	1
RHTR	1	0	1
QUERCUS seedl	0	5	0

MAV23	1997	1998	1999
NOMI	86	73	52
QUEM	38	27	49
MIDY	25	25	20
QUERCUS SP	23	30	14
AGAVE	21	17	21
JUDE	18	21	15
YUSC	17	13	17
MIBI	11	21	15
PROSOPIS	10	15	19
TURPENTINE	7	14	3
OPSPI	7	5	7
RHTR	5	4	3
CORY	3	0	1
PINON	2	2	0
PPEAR	2	2	1
RAINBOW	2	1	0
MANZANITA	1	11	27
RHCH	1	1	0
GARRYA	1	1	1
QUERC seedling	0	22	nd
MANZ seedling	0	14	nd
JUNIPER seedl	0	2	nd

MAV26	1997	1998	1999
AGAVE	141	91	100
PROSOPIS	54	74	75
DAWH	30	27	27
MIBI	22	17	20
OPSPI	17	7	3
RAINBOW	14	11	5
EYSENHARDTIA	8	6	9
TURPENTINE	5	4	1
NOMI	5	5	4
MAMMILARIA	4	0	0
HEDGEHOG	3	2	1
MIDY	1	2	2
JUDE	1	1	1
BAPT	0	1	1

MAV27	1997	1999
AGAVE	210	151
EYSENHARDIA	64	58
MIDY	34	17
RAINBOW	30	17
TURPENTINE	18	3
OPSPI	14	4
DES BROOM	13	21
QUERCUS SP	12	3
PROSOPIS	5	5
MIBI	5	4
NOMI	5	5
JUMO	4	1
QUEM	3	2
MAMMILARIA	2	0
DAWH	2	2
PPEAR	1	1
CORYPHANTHA	1	1
GARRYA	1	1
JUDE	1	2
RHCH	1	2

MAV28	1997	1999
AGAVE	193	173
TURP	nd	30
MIBI	nd	27
RAINBOW	nd	25
NOMI	nd	20
CORY	nd	18
OPSPI	nd	11
HEDGEHOG	nd	8
PROSOPIS	nd	2
DAFO	nd	1
JUDE	nd	1
SOTOL	nd	1
PPEAR	nd	1

SUMMARY TABLE, MAVERICK BURN, 1997-1999, DENSITY (# PLANTS/PLOT)

McD1	1997	1999
TURPENTINE	78	42
AGAVE	92	96
PRGL	54	61
RAINBOW	31	16
QUEM	33	32
EYSENHARDTIA	25	25
MIBI	16	7
NOMI	14	16
DAFO	12	9
MIDY	8	17
OPSPI	8	7
MANZANITA	4	13
HEDGEHOG	4	4
DESERT BROOM	4	3
QUAR	1	1
YUSC	1	1
COURSETIA	1	0

McD2	1997	1999
PROSOPIS	93	95
MIBI	52	41
AGAVE	27	21
NOMI	11	8
BAPT	7	6
OPSPI	5	3
PPEAR	4	4
YUSC	3	2
CORYPHANTHA	1	1
DAWH	1	1
RAINBOW	1	0

MAV29	1997	1999
QUERCUS	110	97
NOMI	109	110
AGAVE	106	69
MIDY	95	88
YUSC	27	25
QUEM	21	18
DAWH	18	14
TURPENTINE	16	19
DAFO	15	nd
MIBI	10	11
RHCH	9	13
QUAR	4	nd
RAINBOW	3	2
QUHY	3	2
MANZANITA	2	4
OPSPI	2	2
EYSENHARDTIA	2	2
JUDE	1	1
JUMO	1	1
PINON	1	0
HEDGEHOG	1	0
GUSA/TURP	0	19

Report to the Malpai Borderlands Group:

Post-Fire Vegetation Sampling at the Maverick Burn, 1997

Peter Sundt
Rangeland Consultant
HC1 Box 5610, Pima, Arizona 85543

November 3, 1997

Introduction

Photo stations and vegetation monitoring plots were established in 1996 to assess the effects of the proposed Maverick Burn in the Peloncillo Mountains of southeastern Arizona and southwestern New Mexico. The burn was conducted in June 1997. In October 1997 the plots and photo stations that burned were re-sampled and several new plots and photo stations were established to monitor changes in the burned area. This report presents the data from the 1997 vegetation plot sampling, with brief evaluation of the effects of the fire to date.

Methods

The sampling methods followed the general recommendations of the Science Advisory Committee of the MBG. At each plot canopy cover was evaluated by the point line method for all perennial plant species, for annual forbs and grasses, and for litter, rock and bare soil. At the plots that were established after the fire, all woody plants in the plots were counted and evaluated for the degree of burn damage by classifying them into one of the following categories: 1) unburned; 2) plant not top-killed, less than 50% of the pre-fire live tissue killed by the fire; 3) plant not top-killed, more than 50% of the pre-fire live tissue killed by the fire; 4) plant top-killed but resprouting from the base; and 5) dead. Percent mortality data reported in the plot data sheets were calculated on a per plot basis, including any unburned plants in the total. At plots 17 and 28 the principal objective of vegetation sampling was to characterize the vegetation surrounding the agave study plots of Liz Slossen of Arizona State University. All agaves were counted in these two plots.

Fire damage to individual plants sometimes made distinguishing among the 3 species of tree oaks (Quercus emoryi, Q. arizonica and Q. oblongifolia) and the 2 species of junipers (Juniperus monosperma and J. deppeana) impossible; in those cases the plant was called "Quercus sp" or "Juniper sp." Similarly, dead snakeweeds and dead turpentine bushes were often indistinguishable and the category "Turp/Gusa" was used.

Brief descriptions of the monitoring plot locations are included in the appendix of this report, with correct (i.e. unscrambled) GPS positions, slope, aspect, elevation, fire intensity, and details of plot layouts. A list of plants with field codes, common and scientific names is included.

Two plots (McD1 and McD2) were established in October 1997 to monitor the changes in vegetation in the area of the 1994 Sycamore Canyon wildfire. Both plots are adjacent to photo points that were photographed in 1994 and 1995. Data from these plots is included here.

Results

Table 1 presents the fire damage data for those woody species with enough individuals in the plots to allow conclusions to be drawn. Percent mortality is calculated on a per plot basis (including unburned plants) as well as on the basis of burned plants only. Note that the intensity of the fire varied among plots, so that effects on the vegetation can be expected to be different among plots. For example, plot 20 is in an area of high fire intensity (probably where a load of napalm was dropped), where rocks exploded and the ground was discolored. By contrast, plot 22 is in a low intensity area, where the fire apparently crept slowly around leaving many plants unburned. Plot 23 is on the same slope as plot 22, about 300m downslope, but burned more thoroughly and possibly hotter than 22.

When data from all the plots are averaged, the following woody plant species suffered 10% or less mortality: agave, Emory oak, Toumey oak, mountain Yucca, velvetpod and catclaw mimosas, and kidneywood. Between 10% and 25% mortality: sacahuiste, mesquite, Arizona white oak, and rainbow cactus. Between 30% and 60% mortality: oneseed juniper and cholla cactus. Over 70% mortality: alligator juniper, turpentine bush, pointleaf manzanita, and pinon pine. Plants with vigorous basal resprouting include sacahuiste, mesquite, Emory, Toumey and silverleaf oaks, mountain Yucca, the mimosas, silktassel bush, evergreen sumac and kidneywood.

One of the plots that was set up in 1996 burned in the 1997 fire: plot 14 near the mouth of Estes Canyon on a north-facing slope. The plot was re-sampled in October 1997 following a summer of relatively good rains. Comparative data for pre- and post-fire canopy cover is presented in Table 2. Total bare ground doubled following the fire. Snakeweed and threeawn grasses were almost eliminated by the fire. Covers of sacahuiste, mesquite, and oneseed juniper were much reduced. Annual forbs and grasses germinated abundantly.

A couple of heavy summer rainstorms have caused noticeable soil movement on steep slopes, especially in high intensity burn areas, such as the steep slope opposite photo station 21 in upper Cottonwood basin, where 6 inch deep rills have formed and much soil has accumulated in the stream drainage below.

MAVERICK BURN VEGETATION MONITORING PLOT DESCRIPTIONS

Maverick 1

The plot is approx 70m north of Lion Cr., west of the confluence of Lion and Cloverdale Creeks, across Lion Cr. from Mav1 photo point, on the south-facing slope of the hill. UTM 0688727e 3483400n +/- 3.9m. Baseline runs east-west, ends marked by rock cairns, east end is near old wooden feed trough in clearing. Baseline is 210 ft long, eight 200ft transects every 30ft (including 0 and 300), sample pts every 2 ft. Plot did not burn 1997.

Maverick 3

The plot is on the north side of Miller Creek, on south-facing slope above creek bottom. UTM 0687252e 3484094n +/- 7.1m. 210ft baseline runs from painted rock cairn uphill towards peak to NW. Eight 200ft transects run SW to NE, sample points every 2ft. Plot did not burn 1997.

Maverick 8

The plot is along the trail that connects Maverick Spring to Honeymoon Tank, in a wide clearing dotted with small junipers. 210ft baseline runs SE to NW, marked at ends with unpainted rock cairns. The painted rock cairn at photo point Mav8 is 104ft from the NW end of the baseline. Eight 200ft transects every 30ft, sample points every 2ft. The total numbers of Alligator Junipers and Emory Oaks were counted in the plot. Plot did not burn 1997.

Maverick 11

The plot is located on a south-facing slope east of Miller Spring and NW of Prospect Tank. The prominent pillars are across a steep draw to the west. The 140ft baseline runs at 294 degrees magnetic; the red-painted rock cairn marking photo point Mav11 is 30ft from the E end. Eight 200ft transects run uphill (approx. 24 deg magnetic) from the baseline, every 20ft along baseline, sample pts every 2ft. Plot did not burn 1997.

Maverick 14

The plot is on the north-facing slope directly across Estes Canyon from photo point Mav14, approx 0.2 mi upstream from confluence with Cottonwood Canyon. UTM 0681616e 3483161n. Compass bearings: E end of baseline to pillars at mouth of Estes 300 deg magnetic; w end of baseline to pillars 337deg; w end to photo point 003 deg; W end to nearest peak 194 deg. Slope 15-20 deg, aspect North, elev 4900 ft. The 175ft baseline runs 90 deg magnetic. Eight 200ft transects every 25 ft, sample points every 2ft (1996). Plot changed to 50m baseline with ten 100m transects, sample pts every 1m in Oct 1997. All 4 corners marked with T posts. Plot burned (medium intensity) in 1997.

Maverick 16

The plot is on an east-facing slope on the western side of the basin of which Wood's Tank is the center. UTM 0680115e 3481050n +/- 7.6m. The 210ft baseline runs 220 deg magnetic from the red-painted rock cairn at photo point Mav16. Eight 200ft transects run uphill (310 deg magnetic), transects every 30ft, sample points every 2ft. Plot did not burn in 1997.

Maverick 17

The plot is in the grassy flat on the west side of Geronimo Trail in upper Cottonwood Basin, about 0.2mi NE of the state line monument. UTM 0685500e 3486785n +/- 5.2m. Slope 0-5 deg, aspect South, elev 5320ft. 100m x 100m plot, 8 transects, sample pts every 1m. Baseline runs 20 deg magnetic from S end, marked with T posts at each end, far corners marked with rock cairn. Plot did not burn 1997.

Maverick 18

The plot is on the steep slope on the NW side of the Mormon Battalion monument in the pass at the head of Cottonwood basin. UTM 0686382e 3487702n +/- 4.2m. Slope 20-25 deg, aspect southeast, elev 5900ft. 50m x 50m plot, 10 transects, sample pts every 50cm. Baseline parallels fence (328 deg magnetic), marked with T posts at each end, transects run along contour to west, far corners marked with rock cairns. Medium intensity fire 1997.

Maverick 19

The plot is on a bench above Cottonwood Creek across the creek from the turnout about 0.5mi NE of the state line monument. UTM 0685743e 3486741n +/- 5.0m. Slope 5-10 deg, aspect west, elevation 5360ft. 50m x 50m plot, 10 transects run uphill, sample pts every 50cm, all 4 corners marked with T posts. Baseline runs 188 deg magnetic, along lower contour of plot. Medium-high intensity fire 1997.

Maverick 20

The plot is on a SW-facing slope approx. 0.3mi E of the turnout on Geronimo Trail described above. UTM 0685979e 3486612n +/- 4.9m. Slope 10-15 deg, aspect southwest, elev 5500ft. 50m x 50m plot, 10 transects run uphill, sample pts every 50cm, far corners marked with rock cairns. Baseline runs 120 deg magnetic, ends marked with T posts. High intensity burn 1997.

Maverick 22

The plot is on a SW-facing slope in the upper Cottonwood basin, east of Geronimo Trail. UTM 0686071e 3486326n +/- 4.6m. Slope 5-10 deg, aspect southwest, elev 5480 ft. 50m x 50m plot, 10 transects run uphill, sample pts every 50cm, far corners marked with rock cairns. Baseline runs 140 deg magnetic, ends marked with T posts. Low intensity burn 1997.

Maverick 23

The plot is on the same slope as plot 22, about 300m downslope. UTM 0685947e 3486305n +/- 4.5m. Slope 5-10 deg, aspect southwest, elev 5440 ft. 50m x 50m plot, 10 transects run uphill, sample pts every 50cm, far corners marked with rock cairns. Baseline runs 160 deg magnetic, ends marked with T posts. Medium intensity burn 1997.

Maverick 26

The plot is on a steep slope N of a tributary of Miller Spg canyon very near the state line and adjacent to the road which leads past a wildlife water catchment. UTM 0685031e 3485370n. Slope 15-20 deg, aspect south, elev 5280ft. 50m x 50m plot, 10 transects run along the contour, sample pts every 50cm, far corners marked with rock cairns. Baseline runs 340 deg magnetic uphill, ends marked with T posts. Low to medium intensity burn 1997.

Maverick 27

The plot is along the trail from Lee Howard Spring to Cowboy Flat in upper Sycamore Canyon. UTM 0684913e 348032n +/- 4.4m. Slope 15-20 deg, aspect west, elev 5120ft.

50m x 50m plot, 10 transects run along the contour, sample pts every 50cm, far corners marked with rock cairns. Baseline runs 50 deg magnetic uphill, ends marked with T posts. Low to medium intensity burn 1997.

Maverick 28

The plot is on Cowboy Flat in an area of relatively dense agaves. UTM 0685153e 3480185n +/- 6.2m. Slope 0-5 deg, aspect west, elev 5220ft. 50m x 50m plot, 10 transects, sample pts every 50cm, far corners marked with rock cairns. Baseline runs 128 deg magnetic, ends marked with T posts. Only a corner of the plot burned 1997.

Maverick 29

The plot is on a slope on the SE edge of Cowboy Flat. UTM 0685442e 3479820n. Slope 15-20 deg, aspect west, elev 5380ft. 50m x 50m plot, 10 transects run along the contour, sample pts every 50cm, far corners marked with rock cairns. Baseline runs 64 deg magnetic uphill, ends marked with T posts. Medium intensity burn 1997.

McD1

The plot is on a west-facing slope on the south side of Sycamore Canyon. UTM 0683540e 3479607n +/- 5.7m. Slope 10-15 deg, aspect west, elev 4830ft. 50m x 50m plot, 10 transects run along contour, sample pts every 50cm, far corners marked with rock cairns. Baseline runs uphill, ends marked with T posts. Plot burned in 1994 Sycamore Canyon wildfire.

McD2

The plot is on a north-facing ridgecrest on the south side of Sycamore Canyon. UTM 0682816e 3479183n. Slope 5-10 deg, aspect north, elev 4840ft. 50m x 50m plot, 10 transects run uphill, sample pts every 50cm, far corners marked with rock cairns. Baseline ends marked with T posts. Plot burned in 1994 Sycamore Canyon wildfire.

Table 1. FIRE DAMAGE TO WOODY PLANTS, MAVERICK BURN, 1997

		unburned	<50% damage	>50% damage	topkill w/ resprout	dead	% mortality by plot	% mortality burned plts
Sacahuiste								
	14	5	0	4	286	6	2.0%	2.0%
	18	0	0	1	135	10	6.8%	6.8%
	19	1	1	1	82	32	27.4%	27.6%
	20	1	0	1	45	16	25.4%	25.8%
	22	13	0	0	70	1	1.2%	1.4%
	23	4	1	0	81	44	33.8%	34.9%
	26	0	0	0	5	0	0.0%	0.0%
	27	0	0	0	5	1	16.7%	16.7%
	29	4	0	1	104	22	16.8%	17.3%
						average:	14.5%	14.7%
Mesquite								
	14	9	7	8	105	42	24.6%	25.9%
	22	3	1	0	0	0	0.0%	0.0%
	23	0	0	1	9	8	44.4%	44.4%
	26	2	5	3	44	18	25.0%	25.7%
	27	1	1	0	3	1	16.7%	20.0%
						average:	22.1%	23.2%
Agave								
	14	2	3	48	0	0	0.0%	0.0%
	18	3	33	52	0	7	7.4%	7.6%
	20	0	3	9	0	2	14.3%	14.3%
	22	56	28	43	1	8	5.9%	10.0%
	23	0	4	17	0	8	27.6%	27.6%
	26	5	61	75	0	8	5.4%	5.6%
	27	14	87	109	0	6	2.8%	3.0%
	29	6	34	66	0	2	1.9%	2.0%
						average:	8.1%	8.7%
Oneseed juniper								
	14	2	12	3	0	50	74.6%	76.9%
	27	2	2	0	0	0	0.0%	0.0%
						average:	37.3%	38.5%
Alligator juniper								
	18	0	0	0	0	3	100.0%	100.0%
	19	0	0	1	0	17	94.4%	94.4%
	20	0	0	0	0	3	100.0%	100.0%
	22	8	5	7	1	3	12.5%	18.8%
	23	0	2	13	3	21	53.8%	53.8%
	29	0	0	1	0	2	66.7%	66.7%
						average:	71.2%	72.3%
Emory oak								
	14	0	0	1	3	0	0.0%	0.0%
	18	0	0	5	5	0	0.0%	0.0%
	22	7	1	4	2	0	0.0%	0.0%
	23	0	1	2	35	3	7.3%	7.3%
	27	0	0	1	2	0	0.0%	0.0%
	29	0	0	1	20	1	4.5%	4.5%
						average:	2.0%	2.0%

FIRE DAMAGE TO WOODY PLANTS, MAVERICK BURN, 1997

		<50%	>50%	topkill w/		% mortality	% mortality
	unburned	damage	damage	resprout	dead	by plot	burned plts
Arizona white oak							
18	0	0	0	4	3	42.9%	42.9%
23	0	0	1	9	3	23.1%	23.1%
29	1	1	0	2	0	0.0%	0.0%
					average:	22.0%	22.0%
Toumey oak							
19	0	2	4	126	3	2.2%	2.2%
20	0	1	0	69	2	2.8%	2.8%
23	0	0	0	7	0	0.0%	0.0%
					average:	1.7%	1.7%
Pointleaf manzanita							
18	0	0	0	0	4	100.0%	100.0%
19	0	0	3	3	57	90.5%	90.5%
20	0	0	2	1	122	97.6%	97.6%
23	0	0	1	0	12	92.3%	92.3%
29	0	0	2	0	10	83.3%	83.3%
					average:	92.7%	92.7%
Pinon pine							
19	2	11	6	0	49	72.1%	74.2%
20	0	0	0	0	32	100.0%	100.0%
23	0	2	0	0	20	90.9%	90.9%
					average:	87.7%	88.4%
Turpentine bush							
18	0	1	1	1	16	84.2%	84.2%
22	15	0	0	0	6	28.6%	100.0%
23	0	5	2	0	62	89.9%	89.9%
26	0	4	1	0	40	88.9%	88.9%
27	15	3	0	0	35	66.0%	92.1%
29	1	5	8	2	70	81.4%	82.4%
					average:	73.2%	89.6%
Cholla cactus							
14	5	3	4	9	38	64.4%	70.4%
18	1	2	2	3	28	77.8%	80.0%
22	20	7	7	6	15	27.3%	42.9%
23	0	1	1	5	24	77.4%	77.4%
26	6	6	3	2	21	55.3%	65.6%
27	3	3	0	8	2	12.5%	15.4%
29	0	0	1	1	4	66.7%	66.7%
					average:	52.8%	58.0%
Mountain Yucca							
14	2	0	18	17	2	5.1%	5.4%
18	0	5	13	16	0	0.0%	0.0%
19	1	2	6	30	4	9.3%	9.5%
20	0	0	4	12	0	0.0%	0.0%
22	2	0	2	2	0	0.0%	0.0%
23	0	1	4	12	4	19.0%	19.0%
29	1	2	17	7	2	6.9%	7.1%
					average:	5.9%	6.0%

FIRE DAMAGE TO WOODY PLANTS, MAVERICK BURN, 1997

	unburned	<50% damage	>50% damage	topkill w/ resprout	dead	% mortality by plot	% mortality burned plts
Velvetpod mimosa							
14	0	0	0	6	0	0.0%	0.0%
18	0	0	8	123	0	0.0%	0.0%
19	0	0	0	59	0	0.0%	0.0%
20	0	0	0	32	1	3.0%	3.0%
22	4	0	0	61	0	0.0%	0.0%
23	0	0	0	25	1	3.8%	3.8%
27	0	0	1	33	1	2.9%	2.9%
29	0	1	0	94	0	0.0%	0.0%
					average:	1.6%	1.6%
Catclaw mimosa							
14	1	0	0	10	0	0.0%	0.0%
26	0	0	0	22	2	8.3%	8.3%
27	0	0	0	5	1	16.7%	16.7%
29	0	0	0	10	0	0.0%	0.0%
					average:	5.3%	5.3%
Kidneywood							
26	0	0	0	8	0	0.0%	0.0%
27	8	18	0	38	2	3.0%	3.4%
					average:	1.5%	1.7%
Rainbow cactus							
18	3	35	20	1	15	20.3%	21.1%
26	3	6	5	0	2	12.5%	15.4%
27	9	9	12	0	3	9.1%	12.5%
29	2	1	0	0	2	40.0%	66.7%
					average:	16.7%	23.5%

Table 2. Plot Mav 14--Comparison of pre- and post-fire canopy covers.

	1996 mean	s.e.	1997 mean	s.e.	sig change
Soil hits	12.8	1.3	31.4	1.3	up
Rock hits	10.0	1.7	17.3	1.8	up
Total bare ground	22.8	2.7	48.7	2.3	up
Litter	17.5	2.2	14.2	1.6	none
Annual forb	0.6	0.5	5.3	0.9	up
Annual grass	1.4	0.4	6.6	1.0	up
Sacahuiste	15.0	3.2	1.8	0.4	down
Oneseed juniper	9.9	3.1	3.7	0.9	down
Mesquite	9.5	1.6	0.9	0.3	down
Curly mesquite	9.1	3.3	7.8	1.5	none
Snakeweed	8.4	1.6	0.1	0.1	down
Sideoats grama	5.8	1.0	6.4	0.8	none
Hairy grama	2.0	0.6	1.0	0.4	none
Threeawn grass	1.3	0.7	0.1	0.1	down
Texas bluestem	1.3	0.6	1.0	0.4	none
Oak	0.9	0.9	0.4	0.2	none
Plains lovegrass	0.8	0.4	0.3	0.3	none
Bullgrass	0.6	0.3	0.4	0.3	none
Turpentine bush	0.1	0.1	0.0	0.0	none
Tobosa	0.1	0.1	0.0	0.0	none
Cane beardgrass	0.1	0.1	0.1	0.1	none
Silktassel bush	0.1	0.1	0.0	0.0	none
Wolftail	0.1	0.1	0.1	0.1	none
SOEL	0.0	0.0	0.5	0.3	none
Green Sprangletop	0.0	0.0	0.4	0.3	none
Mountain Yucca	0.0	0.0	0.3	0.2	none
ARORA	0.0	0.0	0.2	0.2	none
DECO	0.0	0.0	0.2	0.1	none
Blue grama	0.0	0.0	0.1	0.1	none
Cholla	0.0	0.0	0.1	0.1	none
SEDGE	0.0	0.0	0.1	0.1	none
Vine mesquite grass	0.0	0.0	0.1	0.1	none

PLOT Maverick Burn 14
DATE Oct 8 1997

	1	2	3	4	5	6	7	8	9	10	mean	s.e.
Rock	19	18	12	16	27	27	12	12	12	18	17.3	1.8
Soil	34	24	37	29	35	32	35	27	33	28	31.4	1.3
Total bare ground	53	42	49	45	62	59	47	39	45	46	48.7	2.3
Litter	8	15	14	18	13	12	8	11	18	25	14.2	1.6
HIBE	5	8	9	3	1	5	10	18	12	7	7.8	1.5
Annual grass	2	6	3	8	3	7	9	11	8	9	6.6	1.0
BOCU	9	10	9	8	6	5	3	6	5	3	6.4	0.8
Annual forb	7	7	5	8	3	2	5	10	5	1	5.3	0.9
JUMO	2	9	5	3	4	2	6	0	0	6	3.7	0.9
NOMI	2	0	1	1	1	2	2	3	5	1	1.8	0.4
BOHI	4	0	1	1	0	1	1	1	0	0	0.9	0.4
SCCI	0	1	2	0	0	1	4	1	0	1	1.0	0.4
PROSOPIS	3	1	0	0	1	1	0	0	2	1	0.9	0.3
SOEL	2	0	1	0	2	0	0	0	0	0	0.5	0.3
LEDU	0	2	2	0	0	0	0	0	0	0	0.4	0.3
QUERCUS SP	0	0	1	0	1	0	0	0	1	1	0.4	0.2
MUEM	0	0	0	0	2	0	2	0	0	0	0.4	0.3
ERIN	0	0	0	3	0	0	0	0	0	0	0.3	0.3
YUSC	1	0	0	0	0	1	0	0	0	1	0.3	0.2
AROR	0	0	0	0	0	2	0	0	0	0	0.2	0.2
DECO	0	0	0	1	0	1	0	0	0	0	0.2	0.1
BOGR	1	0	0	0	0	0	0	0	0	0	0.1	0.1
OPSPI	0	1	0	0	0	0	0	0	0	0	0.1	0.1
SEDGE	0	0	0	0	0	0	1	0	0	0	0.1	0.1
LYPH	0	1	0	0	0	0	0	0	0	0	0.1	0.1
ARIS	0	0	0	0	0	0	1	0	0	0	0.1	0.1
PAOB	1	0	0	0	0	0	0	0	0	0	0.1	0.1
GUSA	1	0	0	0	0	0	0	0	0	0	0.1	0.1
BOBA	0	1	0	0	0	0	0	0	0	0	0.1	0.1

1=unburned
2=no topkill, <50% damage
3=no topkill, >50% damage
4=topkill, resprout
5=dead

	1	2	3	4	5	SUM	% mortality
NOMI	5	0	4	286	6	301	2%
PROSOPIS	9	7	8	105	42	171	25%
JUMO	2	12	3	0	50	67	75%
OPSPI	5	3	4	9	38	59	64%
AGAVE	2	3	48	0	0	53	0%
YUSC	2	0	18	17	2	39	5%
TURP/GUSA	0	0	0	0	34	34	100%
QUERCUS SP	0	0	6	6	3	15	20%
MIBI	1	0	0	10	0	11	0%
MIDY	0	0	0	6	0	6	0%
PPEAR	1	1	1	0	1	4	25%
QUEM	0	0	1	3	0	4	0%

Plot Mav 14 continued

	1	2	3	4	5	SUM	% mortality
RAINBOW	0	2	0	0	0	2	0%
DAWH	0	1	0	0	0	1	0%
RHCH	0	0	0	0	1	1	100%
HEDGEHOG	0	0	1	0	0	1	0%
CEMO	1	0	0	0	0	1	0%

Notes: Turp/Gusa only counted in easternmost 2 transects (10x100m)

PLOT	Maverick Burn 17									
DATE	Sept 30 1997									
	1	2	3	4	5	6	7	8	mean	s.e.
Soil hits	17	22	15	19	3	12	19	13	15.0	2.1
Rock hits	10	9	7	7	5	12	12	10	9.0	0.9
Total bare ground	27	31	22	26	8	24	31	23	24.0	2.6
Litter	4	4	6	6	3	5	4	10	5.3	0.8
Annual forb	0	3	1	2	3	2	4	2	2.1	0.4
BOGR	26	32	22	18	5	6	15	5	16.1	3.6
PROSOPIS	7	7	8	9	14	2	5	9	7.6	1.2
GUSA	11	9	10	9	6	0	5	7	7.1	1.2
HIBE	3	3	8	17	6	4	3	10	6.8	1.7
ERIN	5	3	4	5	15	4	9	9	6.8	1.4
TURPENTINE	6	3	2	0	12	8	12	6	6.1	1.6
BOCU	8	2	5	4	6	11	4	2	5.3	1.1
BOHI	1	1	2	1	6	2	3	15	3.9	1.7
ARIS	6	3	7	0	4	1	0	1	2.8	1.0
SCCI	0	0	0	1	6	6	4	1	2.3	0.9
MUEM	0	0	0	3	6	2	1	2	1.8	0.7
ACAN	0	2	0	1	4	1	2	2	1.5	0.5
LEDU	2	1	1	1	3	0	3	0	1.4	0.4
NOMI	0	0	0	0	5	4	0	2	1.4	0.7
ERWR	4	0	1	2	0	0	0	0	0.9	0.5
ANN GRASS	1	0	4	1	0	0	0	0	0.8	0.5
PIFI	0	0	0	0	0	5	0	0	0.6	0.6
PAOB	0	0	5	0	0	0	0	0	0.6	0.6
AGAVE	0	0	1	1	1	0	1	0	0.5	0.2
SIDA	1	0	3	0	0	0	0	0	0.5	0.4
BORAD	0	0	0	0	2	0	0	1	0.4	0.3
DICA	0	0	0	0	1	2	0	0	0.4	0.3
HECO	0	0	0	0	0	2	0	0	0.3	0.3
SPH SP	0	0	0	1	0	0	0	0	0.1	0.1
MIDY	0	0	0	0	0	1	0	0	0.1	0.1
ERLE	1	0	0	0	0	0	0	0	0.1	0.1
JUDE	0	0	0	0	0	0	1	0	0.1	0.1
PPEAR	0	0	0	1	0	0	0	0	0.1	0.1
YUSC	0	0	0	0	0	0	1	0	0.1	0.1
TAAU	0	0	0	0	1	0	0	0	0.1	0.1
SEDGE	0	0	0	0	1	0	0	0	0.1	0.1
MIBI	0	0	0	0	0	1	0	0	0.1	0.1
								SUM		
AGAVE DENSITY	22	19	38	38	61	43	101	322		

PLOT Maverick Burn 18
DATE Sept 30 1997

	1	2	3	4	5	6	7	8	9	10	mean	s.e.
Soil hits	42	38	22	23	34	15	25	16	29	22	26.6	2.9
Rock hits	17	18	16	15	20	24	28	24	20	20	20.2	1.3
Total bare ground	59	56	38	38	54	39	53	40	49	42	46.8	2.6
Litter	14	6	24	9	20	10	5	3	9	10	11.0	2.1
Annual forb	3	6	5	10	3	10	8	13	7	12	7.7	1.1
ERIN	4	3	7	10	7	3	11	10	2	4	6.1	1.1
MUEM	3	3	7	7	9	7	5	4	3	2	5.0	0.7
ACAN	1	7	10	4	5	13	4	3	2	0	4.9	1.3
CODI	1	1	2	2	1	1	2	4	5	7	2.6	0.7
BORAD	7	1	0	0	0	3	4	4	5	1	2.5	0.8
BOGR	0	0	4	0	0	1	4	5	3	8	2.5	0.9
BOCU	1	5	3	2	0	9	0	1	1	0	2.2	0.9
NOMI	3	5	1	3	3	2	0	0	3	1	2.1	0.5
SCCI	0	3	2	7	0	6	0	0	1	1	2.0	0.8
MIDY	1	4	0	3	0	1	2	4	1	0	1.6	0.5
Annual grass	0	0	0	0	0	0	3	5	5	1	1.4	0.7
ALLIUM	0	0	0	0	0	0	1	1	1	5	0.8	0.5
BOHI	1	0	0	2	1	3	1	0	0	0	0.8	0.3
LYPH	0	0	0	0	0	0	0	6	1	0	0.7	0.6
YUSC	1	0	1	0	0	0	0	0	1	2	0.5	0.2
AGAVE	0	0	0	2	0	0	0	1	0	1	0.4	0.2
ARIS	1	0	0	0	0	0	2	0	1	0	0.4	0.2
ASTRAGALUS	0	0	0	2	0	1	0	0	0	0	0.3	0.2
QUEM	0	0	3	0	0	0	0	0	0	0	0.3	0.3
ERWR	1	0	0	0	0	0	0	0	0	1	0.2	0.1
SEDGE	0	0	1	1	0	0	0	0	0	0	0.2	0.1
DAWH	0	0	0	0	0	0	0	0	1	0	0.1	0.1
RAINBOW	0	0	0	0	0	0	0	0	0	1	0.1	0.1

1=unburned
2=no topkill, <50% damage
3=no topkill, >50% damage
4=topkill, resprout
5=dead

	1	2	3	4	5	SUM	%mortality
NOMI	0	0	1	135	10	146	7%
MIDY	0	0	8	123	0	131	0%
AGAVE	3	33	52	0	7	95	7%
RAINBOW	3	35	20	1	15	74	20%
OPSPI	1	2	2	3	28	36	78%
YUSC	0	5	13	16	0	34	0%
TURPENTINE	0	1	1	1	16	19	84%
DAWH	0	0	17	1	0	18	0%
QUEM	0	0	5	5	0	10	0%
PPEAR	0	1	2	0	6	9	67%
QUAR	0	0	0	4	3	7	43%
MANZANITA	0	0	0	0	4	4	100%
JUNIPER SP	0	0	2	0	2	4	50%

Plot Mav 18 continued

	1	2	3	4	5	SUM	%mortality
JUDE	0	0	0	0	3	3	100%
QUERCUS SP	0	0	0	1	1	2	50%
EYSENHARDTIA	0	0	0	2	0	2	0%
PINON	0	0	0	0	1	1	100%
GARRYA	0	0	0	1	0	1	0%
MIBI	0	0	0	1	0	1	0%
JUMO	0	0	0	1	0	1	0%

PLOT Maverick Burn 19
DATE Oct 1 1997

	1	2	3	4	5	6	7	8	9	10	mean	s.e.
Soil hits	55	49	45	28	37	40	57	38	41	45	43.5	2.7
Rock hits	15	19	6	17	14	11	10	12	15	26	14.5	1.7
Total bare ground	70	68	51	45	51	51	67	50	56	71	58.0	3.1
Litter	10	18	25	37	26	20	18	21	30	19	22.4	2.4
Annual forb	13	11	15	7	11	17	10	19	9	9	12.1	1.2
QUTO	0	0	6	1	10	9	3	4	2	0	3.5	1.2
Annual grass	0	0	1	4	0	1	0	3	0	0	0.9	0.5
NOMI	3	0	0	0	1	0	0	0	1	0	0.5	0.3
ACAN	0	2	0	0	0	0	0	0	3	0	0.5	0.3
ARIS	1	0	0	0	0	0	0	2	0	0	0.3	0.2
QUEM	3	0	0	0	0	0	0	0	0	0	0.3	0.3
PINON	0	0	0	3	0	0	0	0	0	0	0.3	0.3
MIDY	0	1	0	0	0	1	0	0	0	1	0.3	0.2
ERIN	0	0	0	1	0	0	0	0	0	0	0.1	0.1
MUEM	0	0	0	0	0	0	0	1	0	0	0.1	0.1

1=unburned
2=no topkill, <50% damage
3=no topkill, >50% damage
4=topkill, resprout
5=dead

	1	2	3	4	5	SUM	%mortality
QUTO	0	2	4	126	3	135	2%
NOMI	1	1	1	82	32	117	27%
PINON	2	11	6	0	49	68	72%
MANZANITA	0	0	3	3	57	63	90%
MIDY	0	0	0	59	0	59	0%
YUSC	1	2	6	30	4	43	9%
JUDE	0	0	1	0	17	18	94%
PPEAR	0	0	1	4	5	10	50%
UNID TREE					8	8	100%
QUERCUS SP	0	1	1	2	4	8	50%
RHCH	0	0	0	3	0	3	0%
AGAVE	0	1	1	0	1	3	33%
GARRYA	0	0	0	2	0	2	0%
DAWH	0	0	1	0	0	1	0%

Notes: transects every 5m, start at 0m, end at 45m.

PLOT Maverick Burn 20
DATE Oct 1 1997

	1	2	3	4	5	6	7	8	9	10	mean	s.e.
Soil hits	43	49	49	57	60	60	68	72	59	69	58.6	3.0
Rock hits	17	20	22	13	28	30	23	12	16	12	19.3	2.0
Total bare ground	60	69	71	70	88	90	91	84	75	81	77.9	3.3
Litter	21	10	20	17	8	4	3	5	8	11	10.7	2.1
Annual forb	6	4	2	4	2	2	2	6	5	2	3.5	0.5
MUEM	7	5	6	6	0	2	0	1	5	1	3.3	0.9
QUTO	3	9	1	2	0	0	0	4	0	4	2.3	0.9
NOMI	0	0	0	1	1	2	1	0	0	0	0.5	0.2
ACAN	0	0	1	0	0	0	0	1	1	0	0.3	0.2
DAWH	0	0	0	0	0	0	2	0	0	0	0.2	0.2
MIDY	0	1	0	0	0	0	0	0	0	1	0.2	0.1
SCCI	0	2	0	0	0	0	0	0	0	0	0.2	0.2
ERIN	0	0	0	0	1	0	0	0	0	0	0.1	0.1

1=unburned
2=no topkill, <50% damage
3=no topkill, >50% damage
4=topkill, resprout
5=dead

	1	2	3	4	5	SUM	%mortality
MANZANITA	0	0	2	1	122	125	98%
QUTO	0	1	0	69	2	72	3%
NOMI	1	0	1	45	16	63	25%
MIDY	0	0	0	32	1	33	3%
PINON	0	0	0	0	32	32	100%
DAWH	0	5	14	0	6	25	24%
YUSC	0	0	4	12	0	16	0%
AGAVE	0	3	9	0	2	14	14%
JUDE	0	0	0	0	3	3	100%
RHCH	0	0	0	2	0	2	0%
UNK TREE	0	0	0	0	2	2	100%
MIBI	0	0	0	2	0	2	0%
OPSPI	0	0	1	0	0	1	0%

Notes: transects every 5m, start at 5m, end at 50m. Napalm impact area.

PLOT Maverick Burn 22
DATE Oct 2 1997

	1	2	3	4	5	6	7	8	9	10	mean	s.e.
Soil hits	33	19	12	29	22	19	26	27	30	15	23.2	2.2
Rock hits	18	16	11	21	17	18	14	28	21	16	18.0	1.5
Total bare ground	51	35	23	50	39	37	40	55	51	31	41.2	3.3
Litter	8	4	15	17	9	17	7	8	9	16	11.0	1.5
Annual forb	3	2	4	3	10	9	8	9	10	24	8.2	2.0
SCCI	11	11	4	3	10	3	10	7	9	6	7.4	1.0
ERIN	8	12	10	5	3	8	4	3	2	0	5.5	1.2
BOHI	5	14	5	8	10	5	1	1	1	2	5.2	1.4
JUDE	0	0	18	6	7	0	4	0	0	15	5.0	2.1
MUEM	1	1	3	1	4	4	10	6	3	9	4.2	1.0
BORAD	2	12	1	2	2	4	3	4	0	1	3.1	1.1
ALLIUM	2	6	1	0	1	6	4	2	3	1	2.6	0.7
Annual grass	1	0	2	2	0	4	3	3	3	0	1.8	0.5
NOMI	0	1	5	3	2	0	1	0	2	2	1.6	0.5
BOCU	3	0	1	2	0	2	3	1	0	0	1.2	0.4
MIDY	2	1	1	0	0	1	1	2	1	0	0.9	0.2
QUERCUS SP	0	0	0	0	9	0	0	0	0	0	0.9	0.9
QUTO	0	6	0	0	0	0	0	0	0	0	0.6	0.6
AGAVE	0	0	1	1	1	1	0	0	0	1	0.5	0.2
PIFI	0	0	4	0	0	0	0	0	1	0	0.5	0.4
ACAN	0	0	0	0	1	0	1	0	2	0	0.4	0.2
BEANVINE	0	1	0	1	0	1	0	0	0	0	0.3	0.2
PROSOPIS	2	0	1	0	0	0	0	0	0	0	0.3	0.2
ARIS	0	2	0	0	0	0	0	0	0	0	0.2	0.2
BOBA	0	0	0	0	1	0	1	0	0	0	0.2	0.1
TURPENTINE	0	1	0	0	0	0	0	0	0	0	0.1	0.1
YUSC	1	0	0	0	0	0	0	0	0	0	0.1	0.1
SEDGE	1	0	0	0	0	0	0	0	0	0	0.1	0.1
DECO	0	0	0	0	0	1	0	0	0	0	0.1	0.1
VERBENA	0	0	0	0	0	0	0	0	1	0	0.1	0.1
LYPH	1	0	0	0	0	0	0	0	0	0	0.1	0.1

1=unburned
2=no topkill, <50% damage
3=no topkill, >50% damage
4=topkill, resprout
5=dead

	1	2	3	4	5	SUM	%mortality
AGAVE	56	28	43	1	8	136	6%
NOMI	13	0	0	70	1	84	1%
MIDY	4	0	0	61	0	65	0%
OPSPI	20	7	7	6	15	55	27%
JUDE	8	5	7	1	3	24	13%
TURPENTINE	15	0	0	0	6	21	29%
QUEM	7	1	4	2	0	14	0%
QUERCUS SP	3	1	0	5	0	9	0%
PPEAR	1	0	2	0	4	7	57%
YUSC	2	0	2	2	0	6	0%

Plot Mav 22 continued

	1	2	3	4	5	SUM	%mortality
QUTO	4	1	0	0	0	5	0%
BAPT	0	1	1	2	0	4	0%
PROSOPIS	3	1	0	0	0	4	0%
RAINBOW	2	1	0	0	0	3	0%
MANZANITA	2	0	1	0	0	3	0%
CORYPHANTHA	2	1	0	0	0	3	0%
PINON	1	0	0	0	1	2	50%
UNK CACTUS	2	0	0	0	0	2	0%
GUSA	1	0	0	0	1	2	50%
DAWH	2	0	0	0	0	2	0%
MIBI	1	0	0	0	0	1	0%
HEDGEHOG	0	0	1	0	0	1	0%
RHTR	1	0	0	0	0	1	0%

Notes: Quercus sp may be QUTO/QUEM hybrid? Low intensity burn.

PLOT Maverick Burn 23
DATE Oct 2 1997

	1	2	3	4	5	6	7	8	9	10	mean	s.e.
Soil hits	27	38	32	46	30	36	22	23	26	45	32.5	2.7
Rock hits	17	24	17	18	11	9	17	20	12	13	15.8	1.4
Total bare ground	44	62	49	64	41	45	39	43	38	58	48.3	3.0
Litter	13	19	20	15	39	29	29	29	13	20	22.6	2.7
Annual forb	23	9	20	13	13	11	4	6	24	9	13.2	2.2
MUEM	9	4	4	3	1	2	2	2	2	3	3.2	0.7
SCCI	4	0	1	0	2	1	6	2	3	4	2.3	0.6
BOCU	0	0	1	1	0	1	2	3	6	1	1.5	0.6
Annual grass	0	0	2	2	3	1	3	3	0	1	1.5	0.4
ERIN	1	3	3	0	1	1	1	1	1	1	1.3	0.3
NOMI	3	0	0	1	1	1	2	1	1	2	1.2	0.3
QUAR	0	0	0	0	0	7	4	0	0	0	1.1	0.8
JUDE	0	0	0	0	0	0	1	0	8	0	0.9	0.8
BOHI	1	0	0	0	1	0	1	0	5	0	0.8	0.5
ACAN	0	1	1	0	0	0	3	0	1	0	0.6	0.3
ARIS	0	0	0	0	0	0	2	1	1	0	0.4	0.2
ZEXMANIA	0	0	0	0	0	0	1	2	0	0	0.3	0.2
TURPENTINE	0	0	0	0	0	0	0	0	2	0	0.2	0.2
LONGAWN	0	0	0	0	0	0	0	2	0	0	0.2	0.2
QUEM	0	0	0	0	0	0	0	2	0	0	0.2	0.2
DECO	0	0	0	0	0	0	0	1	0	0	0.1	0.1
MIDY	0	0	0	0	0	0	0	0	1	0	0.1	0.1
CODI	1	0	0	0	0	0	0	0	0	0	0.1	0.1
AGAVE	0	1	0	0	0	0	0	0	0	0	0.1	0.1
ALLIUM	0	0	0	0	0	0	0	0	1	0	0.1	0.1
VERBENA	0	0	0	1	0	0	0	0	0	0	0.1	0.1
PIFI	0	0	0	0	0	1	0	0	0	0	0.1	0.1
LYPH	0	0	0	0	0	0	0	0	1	0	0.1	0.1
BEANVINE	0	0	0	0	0	0	0	0	1	0	0.1	0.1
MIBI	0	0	1	0	0	0	0	0	0	0	0.1	0.1

1=unburned
2=no topkill, <50% damage
3=no topkill, >50% damage
4=topkill, resprout
5=dead

	1	2	3	4	5	SUM	%mortality
NOMI	4	1	0	81	44	130	34%
TURPENTINE	0	5	2	0	62	69	90%
GUSA	0	0	5	0	41	46	89%
QUEM	0	1	2	35	3	41	7%
JUDE	0	2	13	3	21	39	54%
OPSSPI	0	1	1	5	24	31	77%
AGAVE	0	4	17	0	8	29	28%
MIDY	0	0	0	25	1	26	4%
PINON	0	2	0	0	20	22	91%
YUSC	0	1	4	12	4	21	19%
PROSOPIS	0	0	1	9	8	18	44%

Plot Mav 23 continued

	1	2	3	4	5	SUM	%mortality
QUAR	0	0	1	9	3	13	23%
MANZANITA	0	0	1	0	12	13	92%
MIBI	1	0	0	10	1	12	8%
GUSA/TURP	0	0	0	0	8	8	100%
QUTO	0	0	0	7	0	7	0%
QUERCUS SP	2	0	0	4	0	6	0%
RHTR	0	0	0	5	1	6	17%
PPEAR	0	1	1	0	2	4	50%
CORYPHANTHA	1	0	2	0	0	3	0%
RHCH	1	0	0	0	1	2	50%
RAINBOW	1	0	1	0	0	2	0%
GARRYA	0	0	0	1	0	1	0%
JUMO	0	0	0	0	1	1	100%

PLOT Maverick Burn 26
DATE Oct 3 1997

	1	2	3	4	5	6	7	8	9	10	mean	s.e.
Soil hits	18	22	35	28	24	29	19	18	23	31	24.7	1.9
Rock hits	20	22	24	12	30	22	26	14	25	27	22.2	1.8
Total bare ground	38	44	59	40	54	51	45	32	48	58	46.9	2.8
Litter	21	19	9	15	12	15	13	16	21	6	14.7	1.6
BOCU	14	18	11	22	11	9	12	7	7	7	11.8	1.6
HIMU	8	2	2	2	4	7	11	16	7	8	6.7	1.4
Annual grass	7	2	7	1	2	3	1	10	3	8	4.4	1.0
Annual forb	3	1	0	4	0	2	3	8	1	3	2.5	0.7
LEDU	2	5	2	5	2	0	5	1	0	2	2.4	0.6
AGAVE	2	2	4	2	2	2	0	2	5	1	2.2	0.4
ACAN	1	2	0	3	8	1	1	1	0	1	1.8	0.7
SCCI	1	0	2	2	0	0	1	2	4	6	1.8	0.6
PROSOPIS	4	5	0	1	0	0	2	0	0	1	1.3	0.6
HECO	0	0	0	0	0	4	4	3	0	0	1.1	0.6
MUEM	0	0	3	3	0	1	1	0	0	0	0.8	0.4
DAWH	0	0	0	2	0	0	0	2	0	1	0.5	0.3
JUDE	0	0	0	0	5	0	0	0	0	0	0.5	0.5
MIBI	0	0	0	0	5	0	0	0	0	0	0.5	0.5
ARIS	0	0	0	0	1	1	0	0	1	0	0.3	0.2
EYSENHARDTIA	0	0	0	0	0	0	1	0	1	0	0.2	0.1
DICA	0	0	0	0	0	0	1	1	0	0	0.2	0.1
MIDY	0	0	0	0	0	0	0	0	1	0	0.1	0.1
HIBE	1	0	0	0	0	0	0	0	0	0	0.1	0.1
TURPENTINE	1	0	0	0	0	0	0	0	0	0	0.1	0.1
ERIN	0	0	0	1	0	0	0	0	0	0	0.1	0.1
CALLIANDRA	1	0	0	0	0	0	0	0	0	0	0.1	0.1
GUSA	0	1	0	0	0	0	0	0	0	0	0.1	0.1
BOBA	0	0	0	0	0	0	0	0	1	0	0.1	0.1

1=unburned
2=no topkill, <50% damage
3=no topkill, >50% damage
4=topkill, resprout
5=dead

	1	2	3	4	5	sum	%mortality
AGAVE	5	61	75	0	8	149	5%
PROSOPIS	2	5	3	44	18	72	25%
OPSPI	6	6	3	2	21	38	55%
TURP/GUSA	0	0	0	0	15	15	100%
TURPENTINE	0	4	1	0	40	45	89%
MIBI	0	0	0	22	2	24	8%
DAWH	0	4	26	0	1	31	3%
RAINBOW	3	6	5	0	2	16	13%
EYSENHARDTIA	0	0	0	8	0	8	0%
HEDGEHOG	0	0	3	0	1	4	25%
MAMMILARIA	2	0	1	1	0	4	0%
NOMI	0	0	0	5	0	5	0%
MIDY	0	0	0	1	0	1	0%
JUDE	0	1	0	0	0	1	0%

PLOT Maverick Burn 27
DATE Oct 8 1997

	1	2	3	4	5	6	7	8	9	10	mean	s.e.
Rock	34	29	29	25	8	31	38	22	18	18	25.2	2.8
Soil	17	15	15	18	10	24	22	28	14	13	17.6	1.7
Total bare ground	51	44	44	43	18	55	60	50	32	31	42.8	4.0
Litter	7	5	14	4	1	4	15	2	7	5	6.4	1.5
cf MUAR	19	20	18	28	30	11	8	8	4	2	14.8	3.1
HECO	8	2	2	3	11	12	14	13	7	8	8.0	1.4
BORAD	5	4	9	10	10	10	3	6	10	0	6.7	1.1
QUERCUS SP	0	10	0	0	0	0	0	0	12	20	4.2	2.3
TRMO	0	0	0	1	4	0	2	7	12	7	3.3	1.3
SCCI	4	3	2	0	1	1	2	2	10	7	3.2	1.0
Annual grass	1	4	3	3	12	1	1	1	1	0	2.7	1.1
BOHI	0	1	1	1	3	8	1	2	1	3	2.1	0.7
AGAVE	0	4	4	3	0	1	1	0	2	4	1.9	0.5
MUEM	2	1	0	0	1	0	0	0	1	13	1.8	1.3
EYSENHARDTIA	2	1	3	2	0	0	0	0	0	2	1.0	0.4
ERIN	0	0	1	2	3	0	1	1	1	0	0.9	0.3
BEANVINE	0	1	0	0	1	0	2	2	0	2	0.8	0.3
BOCU	0	0	1	1	2	0	0	0	1	2	0.7	0.3
LEDU	2	0	0	0	2	0	0	2	0	0	0.6	0.3
ACAN	0	1	2	1	1	0	0	0	0	0	0.5	0.2
AROR	0	0	0	0	0	0	0	0	3	1	0.4	0.3
MIDY	0	2	0	0	1	0	0	0	1	0	0.4	0.2
Annual forb	1	0	0	0	0	0	1	1	0	1	0.4	0.2
FERN	2	2	0	0	0	0	0	0	0	0	0.4	0.3
LYPH	0	0	1	0	0	0	0	2	0	0	0.3	0.2
ARIS	0	1	0	0	0	0	0	1	0	1	0.3	0.2
PROSOPIS	0	0	0	0	1	0	0	0	0	0	0.1	0.1
GUSA	0	0	1	0	0	0	0	0	0	0	0.1	0.1
DALEA	0	0	0	0	0	0	0	0	0	1	0.1	0.1
RAINBOW	0	0	0	1	0	0	0	0	0	0	0.1	0.1
CALLIANDRA	0	0	0	1	0	0	0	0	0	0	0.1	0.1
cf AGROSTIS	0	0	0	0	0	0	0	0	0	1	0.1	0.1

1=unburned
2=no topkill, <50% damage
3=no topkill, >50% damage
4=topkill, resprout
5=dead

	1	2	3	4	5	SUM	%mortality
AGAVE	14	87	109	0	6	216	3%
EYSENHARDIA	8	18	0	38	2	66	3%
TURPENTINE	15	3	0	0	35	53	66%
DES BROOM	0	0	0	13	29	42	69%
MIDY	0	0	1	33	1	35	3%
RAINBOW	9	9	12	0	3	33	9%
OPSPI	3	3	0	8	2	16	13%
QUERCUS SP	0	4	1	7	0	12	0%
PROSOPIS	1	1	0	3	1	6	17%

Plot Mav 27 continued

	1	2	3	4	5	SUM	%mortality
MIBI	0	0	0	5	1	6	17%
[redacted]NOMI	0	0	0	5	1	6	17%
JUMO	2	2	0	0	0	4	0%
PPEAR	0	0	1	0	2	3	67%
QUEM	0	0	1	2	0	3	0%
MAMMILARIA	1	1	0	0	0	2	0%
CORYPHANTHA	0	0	1	0	1	2	50%
DAWH	0	0	2	0	0	2	0%
BROOM/TURP	0	0	0	0	2	2	100%
MANZANITA	0	0	0	0	1	1	100%
GARRYA	1	0	0	0	0	1	0%
JUDE	0	1	0	0	0	1	0%
RHCH	0	0	0	1	0	1	0%

PLOT Maverick Burn 28
DATE Oct 7 1997

	1	2	3	4	5	6	7	8	mean	s.e.
Soil hits	30	28	26	39	37	42	23	33	32.3	2.4
Rock hits	26	13	20	10	19	15	6	11	15.0	2.3
Total bare ground	56	41	46	49	56	57	29	44	47.3	3.4
Litter	6	7	7	7	5	4	4	9	6.1	0.6
BOHI	7	15	11	13	12	21	16	16	13.9	1.5
BORAD	8	10	7	9	3	2	10	5	6.8	1.1
MUAR	7	12	9	5	2	2	2	3	5.3	1.3
GUSA	2	4	3	1	6	0	6	2	3.0	0.8
ERIN	5	0	5	2	1	1	3	2	2.4	0.7
MOSS	3	0	7	4	2	2	0	1	2.4	0.8
NOMI	0	0	0	0	3	0	5	7	1.9	1.0
BOGR	2	1	1	2	1	0	4	2	1.6	0.4
HIBE	0	2	0	0	1	3	6	0	1.5	0.8
AGAVE	3	0	0	2	2	0	4	0	1.4	0.6
LYPH	2	2	0	1	1	1	1	1	1.1	0.2
SCCI	0	3	1	3	0	0	1	0	1.0	0.5
ACAN	0	0	1	1	3	1	0	0	0.8	0.4
BOCU	0	0	0	0	0	0	1	4	0.6	0.5
BOBA	0	0	0	1	0	0	3	0	0.5	0.4
CALLIANDRA	1	0	0	0	1	0	1	0	0.4	0.2
Annual forb	0	1	0	0	0	0	0	2	0.4	0.3
ERWR	0	0	0	0	1	1	0	0	0.3	0.2
DECO	0	0	0	0	0	2	0	0	0.3	0.3
TURPENTINE	1	0	0	0	0	0	0	0	0.1	0.1
PROSOPIS	1	0	0	0	0	0	0	0	0.1	0.1
ARIS	0	0	1	0	0	0	0	0	0.1	0.1
MIBI	0	0	0	0	0	0	0	1	0.1	0.1
SIDA	0	0	0	0	0	0	0	1	0.1	0.1
CODI	0	0	1	0	0	0	0	0	0.1	0.1

								SUM	MEAN	SE
AGAVE DENSITY	30	32	28	32	30	22	19	193	27.6	1.93

PLOT Maverick Burn 29
DATE Oct 7 1997

	1	2	3	4	5	6	7	8	9	10	mean	s.e.
Soil hits	32	42	40	31	40	21	23	32	25	34	32.0	2.3
Rock hits	9	15	14	15	8	23	17	18	18	15	15.2	1.4
Total bare ground	41	57	54	46	48	44	40	50	43	49	47.2	1.7
Litter	14	10	15	29	26	24	27	23	24	17	20.9	2.0
SCCI	4	5	1	8	5	1	0	8	3	9	4.4	1.0
MUEM	3	2	2	2	4	6	3	5	8	6	4.1	0.7
QUERCUS SP	2	4	9	0	0	7	6	1	1	0	3.0	1.0
BOCU	1	5	3	2	9	4	2	0	1	1	2.8	0.8
Annual grass	3	1	1	6	1	1	2	3	8	0	2.6	0.8
Annual forb	7	2	2	0	3	2	6	1	1	2	2.6	0.7
NOMI	1	4	4	0	1	1	2	5	0	0	1.8	0.6
AROR	5	5	1	3	1	0	0	0	1	1	1.7	0.6
BOHI	5	3	1	0	0	1	0	1	1	1	1.3	0.5
QUEM	0	0	0	0	0	4	1	0	0	5	1.0	0.6
MIDY	2	1	0	2	1	1	0	1	1	1	1.0	0.2
ACAN	2	0	0	0	0	3	4	0	0	1	1.0	0.5
JUMO	0	0	0	0	0	0	6	0	0	0	0.6	0.6
BORAD	0	0	0	0	0	0	0	0	3	2	0.5	0.3
ERIN	1	0	0	0	1	0	0	0	1	1	0.4	0.2
AGAVE	0	0	1	0	0	0	0	1	0	1	0.3	0.2
HIBE	3	0	0	0	0	0	0	0	0	0	0.3	0.3
YUSC	0	0	2	0	0	0	0	1	0	0	0.3	0.2
DAWH	0	0	0	3	0	0	0	0	0	0	0.3	0.3
DALEA SHRUB	0	0	0	0	1	1	0	0	0	0	0.2	0.1
GUSA	0	0	0	0	0	0	0	0	0	1	0.1	0.1
LYPH	1	0	0	0	0	0	0	0	0	0	0.1	0.1
RHCH	0	0	0	0	0	0	1	0	0	0	0.1	0.1
QUHY	0	0	0	0	0	0	1	0	0	0	0.1	0.1
BOBA	0	1	0	0	0	0	0	0	0	0	0.1	0.1
ARIS	0	0	0	0	0	0	0	0	0	1	0.1	0.1

1=unburned
2=no topkill, <50% damage
3=no topkill, >50% damage
4=topkill, resprout
5=dead

	1	2	3	4	5	SUM	%mortality
NOMI	4	0	1	104	22	131	17%
QUERCUS SP	6	4	5	95	4	114	4%
AGAVE	6	34	66	0	2	108	2%
MIDY	0	1	0	94	0	95	0%
TURPENTINE	1	5	8	2	70	86	81%
YUSC	1	2	17	7	2	29	7%
QUEM	0	0	1	20	1	22	5%
DAWH	0	3	13	2	4	22	18%
DALEA	0	0	0	15	0	15	0%
GUSA/TURP	0	0	0	0	14	14	100%
MANZANITA	0	0	2	0	10	12	83%

Plot Mav 29 continued

	1	2	3	4	5	SUM	%mortality
MIBI	0	0	0	10	0	10	0%
RHCH	0	1	2	6	0	9	0%
OPSPI	0	0	1	1	4	6	67%
RAINBOW	2	1	0	0	2	5	40%
QUAR	1	1	0	2	0	4	0%
JUDE	0	0	1	0	2	3	67%
QUHY	2	0	0	1	0	3	0%
JUMO	0	1	0	0	1	2	50%
EYSENHARDTIA	0	0	0	2	0	2	0%
PINON	1	0	0	0	0	1	0%
HEDGEHOG	0	0	1	0	0	1	0%

PLOT McD1
DATE Oct 6 1997

	1	2	3	4	5	6	7	8	9	10	mean	s.e.
Soil hits	22	26	27	36	29	28	23	28	22	22	26.3	1.4
Rock hits	49	39	26	19	38	32	19	25	22	25	29.4	3.1
Total bare ground	71	65	53	55	67	60	42	53	44	47	55.7	3.1
Litter	8	9	8	12	11	8	12	13	22	10	11.3	1.3
TRMO	3	12	17	14	6	8	10	8	6	7	9.1	1.3
BOHI	5	6	5	5	3	1	12	3	1	1	4.2	1.1
BOCU	0	0	0	0	1	4	10	11	4	10	4.0	1.5
BORAD	2	7	3	9	2	8	7	0	0	0	3.8	1.1
GUSA	0	0	0	0	0	1	0	9	12	5	2.7	1.4
QUEM	0	0	7	3	6	7	0	0	0	0	2.3	1.0
PROSOPIS	0	0	0	0	0	6	2	4	2	5	1.9	0.7
ARIS	1	0	0	0	1	0	1	3	5	3	1.4	0.5
ERIN	1	0	1	0	1	3	0	0	2	2	1.0	0.3
HECO	0	0	0	0	0	0	0	1	1	5	0.7	0.5
Annual forb	1	1	3	1	1	0	0	0	0	0	0.7	0.3
AGAVE	1	2	0	0	0	0	0	0	0	4	0.7	0.4
SCCI	0	0	0	0	1	4	0	0	0	0	0.5	0.4
MUEM	1	0	0	1	0	1	1	0	0	0	0.4	0.2
TURPENTINE	0	0	0	0	1	1	2	0	0	0	0.4	0.2
DALEA SP	2	1	1	0	0	0	0	0	0	0	0.4	0.2
LEDU	0	0	0	0	0	0	1	2	0	0	0.3	0.2
AROR	1	0	0	0	0	0	0	0	2	0	0.3	0.2
BOBA	0	0	0	0	0	0	0	1	0	1	0.2	0.1
YUSC	0	0	0	0	0	0	0	0	0	2	0.2	0.2
MIBI	0	0	0	0	0	0	0	0	0	2	0.2	0.2
NOMI	0	0	0	0	1	0	0	0	0	0	0.1	0.1
EYSENHARDTIA	0	0	0	0	1	0	0	0	0	0	0.1	0.1
HIBE	0	0	1	0	0	0	0	0	0	0	0.1	0.1
MIDY	1	0	0	0	0	0	0	0	0	0	0.1	0.1
ELBA	0	0	1	0	0	0	0	0	0	0	0.1	0.1

1=unburned
2=no topkill, <50% damage
3=no topkill, >50% damage
4=topkill, resprout
5=dead

	1	2	3	4	5	SUM	%mortality
TURPENTINE	49	22	7	0	170	248	69%
AGAVE	40	50	2	0	1	93	1%
PRGL	0	0	1	53	9	63	14%
RAINBOW	24	7	0	0	5	36	14%
QUEM	5	10	0	18	0	33	0%
EYSENHARDTIA	4	0	0	21	0	25	0%
MIBI	1	9	2	4	0	16	0%
NOMI	3	0	0	11	1	15	7%
GUSA/TURP	2	0	0	0	11	13	85%
DAFO	8	2	1	1	0	12	0%
MIDY	0	3	1	4	0	8	0%

Plot McD1 continued

	1	2	3	4	5	SUM	%mortality
OPSPI	6	0	0	2	0	8	0%
MANZANITA	1	2	0	1	0	4	0%
HEDGEHOG	2	2	0	0	0	4	0%
DESERT BROOM	0	0	0	4	0	4	0%
QUAR	1	0	0	0	0	1	0%
YUSC	0	1	0	0	0	1	0%
COURSETIA	0	0	0	1	0	1	0%

Notes: plot burned in 1994 Sycamore Cyn fire.

PLOT McD2
DATE Oct 6 1997

	1	2	3	4	5	6	7	8	9	10	mean	s.e.
Soil hits	14	18	31	24	18	18	21	17	23	16	20.0	1.6
Rock hits	7	8	11	7	5	4	16	13	7	0	7.8	1.5
Total bare ground	21	26	42	31	23	22	37	30	30	16	27.8	2.5
Litter	6	12	12	8	8	16	13	3	10	14	10.2	1.3
HIBE	52	51	28	44	46	39	36	41	41	38	41.6	2.3
BOHI	11	6	5	10	10	6	7	19	7	11	9.2	1.3
PROSOPIS	6	3	6	3	3	9	1	1	2	5	3.9	0.8
BOCU	1	4	1	5	1	6	1	2	4	4	2.9	0.6
GUSA	0	1	1	1	4	2	0	0	3	4	1.6	0.5
ERIN	0	0	5	0	1	4	3	1	0	0	1.4	0.6
ARIS	0	3	1	0	3	0	0	0	1	1	0.9	0.4
BOBA	2	0	2	0	0	0	1	0	2	0	0.7	0.3
Annual forb	0	0	0	0	1	1	0	0	1	3	0.6	0.3
Annual grass	0	0	0	0	0	1	0	0	0	4	0.5	0.4
MUEM	0	0	0	0	1	0	0	1	0	0	0.2	0.1
MIBI	0	0	0	1	0	0	0	1	0	0	0.2	0.1
DECO	0	0	1	0	0	0	0	0	0	0	0.1	0.1
DICA	0	0	0	0	0	0	1	0	0	0	0.1	0.1
ERWR	0	0	0	1	0	0	0	0	0	0	0.1	0.1
BAPT	0	0	0	0	0	0	0	1	0	0	0.1	0.1
NOMI	0	0	0	0	0	0	0	0	0	1	0.1	0.1

1=unburned
2=no topkill, <50% damage
3=no topkill, >50% damage
4=topkill, resprout
5=dead

	1	2	3	4	5	SUM	%mortality
NOMI	0	0	0	11	1	12	8%
MIBI	0	15	6	31	0	52	0%
AGAVE	10	15	0	2	1	28	4%
PROSOPIS	0	1	0	92	1	94	1%
GUSA	715	0	0	0	0	715	0%
YUSC	0	1	0	2	0	3	0%
OPSPI	0	1	0	4	4	9	44%
CORYPHANTHA	1	0	0	0	0	1	0%
BAPT	1	0	0	6	0	7	0%
GUSA/TURP	0	0	0	0	190	190	100%
PPEAR	0	3	1	0	2	6	33%
DAWH	0	1	0	0	0	1	0%
RAINBOW	1	0	0	0	0	1	0%

Notes: plot burned in 1994 Sycamore Cyn fire. Unburned GUSAs are probably new recruits.

Includes all those species found in P. Sundt's monitoring plots from 1993 to Nov. 1997. Authorities various, principally Kearney & Peebles, Arizona Flora, Gould, Grasses of southwestern United States, Benson & Darrow, Trees and Shrubs of the Southwestern Deserts, Benson, Cacti of Arizona, Martin et al, Fall Wildflowers of New Mexico, and Allred, Field Guide to the Grasses of New Mexico. Nomenclature is probably archaic in many cases

Thanks for help in identification to R.M. Turner, M. Quinn, R. Felger, P. Warren, R. Van Devender.

Field Code	Common name	Scientific name
ABUT		Abutilon sp
ACA SP		Acalypha sp
ACAN	Fern acacia	Acacia angustissima
ACCO	Whitethorn	Acacia constricta
ACMI		Acacia millefolia
ACOU	Desert holly	Acoutria sp
AGAVE	Century plant, mescal	Agave sp
AGROSTIS	Bentgrass	Agrostis sp
AGPA		Agave palmeri
AGSC		Agrostis scabra
ALIN		Allionia incarnata
ALLIUM	Wild onion	
ALOYSIA	Aloysia	Aloysia sp
AMARANTH		
AMBRO		Ambrosia sp
AMBROSIA	perennial ragweed	Ambrosia sp
ANN ARIS		Aristida adscensionis
ANN BOUTELOUA		Bouteloua barbata
ANN ERAGROSTIS		Eragrostis pectinacea
ANN FLUFFGRASS		Munroa squarrosa
ANN FUZZGRASS		
ANN NEEDLE		Bouteloua aristidioides
ANN PANICUM		Panicum arizonica
ARABIS		Arabis perennans
ARFR		Artemisia frigida
ARIS	Three awn grasses	Aristida spp
AROR	Bentawn, beggartick	Aristida orcuttiana
ART SP		Artemisia filifolia
ASCLEP		Asclepias sp
ASHI		Aspicarpa hirtella
ASTER		Aster sp
ASTRAG		Astragalus spp
ATCA	Fourwing saltbush	Atriplex canescens
ATRIPLEX	Fourwing saltbush	Atriplex canescens
AYFI		Ayenia filiformis
BAAB		Bahia absinthifolia
BACCH		Baccharis sp
BACCHARIS (RW2)		Baccharis pteronioides
BAGL	Seepwillow	Baccharis glutinosa
BAHIA		Bahia absinthifolia

BAILEYA	Baileya	Baileya multiradiata
BAPT	Yerba de pasmo	Baccharis pteronioides
BARREL	Barrel cactus	
BASA	Desert broom	Baccharis sarothroides
BEANVINE 1		Macroptilon sp
BENTAWN	Bentawn, beggartick	Aristida orcuttiana
BERMUDA	Bermuda grass	Cynodon dactylon
BOBA	Cane beardgrass	Bothriochloa barbinodis
BOCH	Sprucetop grama	Bouteloua chondrosioides
BOCO		Boerhaavia coccinea
BOCU	Sideoats grama	Bouteloua curtipendula
BOER	Black grama	Bouteloua eriopoda
BOGR	Blue grama	Bouteloua gracilis
BOHI	Hairy grama	Bouteloua hirsuta
BOMELIA	Chittum wood	Bumelia lanuginosa
BORAD	Purple grama	Bouteloua radicosa
BOU SP		Bouteloua barbata
BOUARI		Bouteloua aristidioides
BRDE		Brayulinea densa
BRICK		Brickellia sp
cf BRICKELLIA (RW3)		Trixis californicus
BROM		Bromus sp
BROMUS		Bromus sp
BUDA	Buffalograss	Buchloe dactyloides
CABA	Locoweed	Cassia bauhinioides
CAER	Fairyduster	Calliandra eriophylla
CARE		Calliandra cf reticulata
CASSIA		Cassia wrightii
CAST		Castilleja sp
CEMO	Mountain mahogany	Cercocarpus montanus
CERE	Net leaf hackberry	Celtis reticulata
CHLI	Desert willow	Chilopsis linearis
CHNA	Rabbitbrush	Chrysothamnus nauseosus
CHVI		Chloris virgata
CODI	Dayflower	Commelina dianthifolia
CONDALIA		Condalia sp
CORY		Coryphantha sp
CORYPHANTHA		Coryphantha sp
CRCO	Croton	Croton corybulosus
CREEP		Erigeron flagellaris
CREO	Creosote bush	Larrea tridentata
CRINKLE LF		Chamaesaracha coronopus
CRINKLEAWN	Crinkleawn grass	Trachypogon montufari
CRUCIFER		unknown Cruciferae
CYDA	Bermuda grass	Cynodon dactylon
DALEA		Dalea sp
DAFO	Woody or feather dalea	Dalea formosa
DAPO		Dalea pogonothera

DAPU		Dasyochloa pulchella
DATURA	Jimson weed	Datura sp
DAWH	Sotol	Dasylirion wheeleri
DAWI		Dalea wislizenii
DAWR		Dalea wrightii
DECO		Desmanthus cooleyi
DESERT BROOM	Desert broom	Baccharis sarothroides
DICA	Arizona cottontop	Digitaria (=Trichachne) californica
DYDE		Dyschoriste decumbens
DYSP		Dyschoriste decumbens
ECFE		Echinocereus fendleri
ELAR		Elymus arizonicus
ELBA	Wooly bunchgrass	Elyonurus barbiculmis
EPHEDRA	Mormon Tea	Ephedra sp
EPTO		should be EPTR
EPTR		Ephedra trifurca
ERAN		Eriogonum annuum
ERCI		Eragrostis cilianensis
ERFL		Erigeron flagellaris
ERIG		Erigeron sp
ERIN	Plains lovegrass	Eragrostis intermedia
ERIO		Erioneuron(=Dasyochloa) pulchella
ERLA		Ericameria (=Haplopappus) laricifolius
ERLE	Lehmann's lovegrass	Eragrostis lehmanniana
ERSP		Ericameria sp
ERWR	Shrubby buckwheat	Eriogonum wrightii
EULA	Winterfat	Eurotia lanata
EUPHORB		unk Euphorbiaceae
EVOL		Evolvulus sp
EVSE		Evolvulus sericeus
EYSENHARDTIA	Kidneywood	Eysenhardtia polystachya
FAPA	Apache plume	Fallugia paradoxa
FERN	Fern	Unknown Pteridophyte
FLAT SPURGE		Euphorbia sp
FORB	Annual forbs (lumped)	
FOX		Foxtail-like grass
FOURWING	Fourwing saltbush	Atriplex canescens
FRVE	Arizona ash	Fraxinus velutina
GAILL		Gaillardia sp
GAMI		Galium microphyllum
GARRYA	Silktassel bush	Garrya wrightii
GARWR	Silktassel bush	Garrya wrightii
GASP		Gaura sp
GAURA	Gaura	Gaura sp
GERAN		Geranium-like forb
GNWR		Gnaphalium wrightii
GRAS	Annual grasses (lumped)	
GRND CHERRY	Ground cherry	Solanum

GUSA	Broom snakeweed	Gutierrezia sarothrae
HAIRY SIDA		Sida sp
HALA	Turpentine bush	Haplopappus laricifolius
HATE	Burroweed	Haplopappus (=Isocoma) tenuisectis
HECI		Helianthus ciliaris
HECO	Tanglehead	Heteropogon contortus
HEDE		Hedeoma dentatum
HEDGEHOG	Hedgehog cactus	Echinocereus or Neolloydia sp
HIBE	Curly mesquite grass	Hilaria berlangeri
HIMU	Tobosa	Hilaria mutica
HODE	Hog potato	Hoffmansegia densa
HYMO	Burrobrush	Hymenoclea monogyra
HYWI		Hymenothrix wislizenii
IPLE		Ipomoea leptotoma
IPOM		Ipomaea sp
IPTH		Ipomaea thurberi
ISTE	Burroweed	Haplopappus (=Isocoma) tenuisectis
JAMA		Jatropha macrorhiza
JUDE	Alligator Juniper	Juniperus deppeana
JUMA	Arizona walnut	Juglans major
JUMO	Oneseed Juniper	Juniperus monosperma
JUN SP		Juniperus sp
KALLSTROEMIA		Kallstroemia sp
KOCR	Junegrass	Koeleria cristata
KOSP	Crucifixion thorn	Koeberlinea spinosa
KRLA		Krameria lanceolata
LARREA	Creosote bush	Larrea tridentata
LEDU	Green sprangletop	Leptochloa dubia
LIPPIA		Lippia sp
LOBO		Chamaesaracha coronopus
LOCO	Locoweed	Cassia bauhinioides
LONGLEAF		
LOOR		Lotus oroboides
LOTUS		Lotus sp
LYCIUM	Wolfberry	Lycium sp
LYPH	Wolftail grass	Lycurus phleoides
MALPIG		Aspicarpa hirtella
MALVACEAE		Hibiscus denudatus
MAMMI		Mammilaria sp
MANZ	Manzanita	Arctostaphylos pungens
MAPI		Machaeranthera pinnatifida
MARIOLA	Mariola	Parthenium incanum
MATA		Machaeranthera tanacetifolius
MAUR		Maurandya sp
MAVU	Horehound	Marrubium vulgare
MELE		Melampodium leucanthum
MESC		Menodora scabra
MIBI	Catclaw mimosa	Mimosa biuncifera

MIDY	Velvet pod mimosa	Mimosa dysocarpa
MOSS	Moss	unknown Pteridophyte
MUAR	Sand muhly	Muhlenbergia arenicola
MUEM	Bullgrass	Muhlenbergia emersleyi
MUH SP		Muhlenbergia sp
MUPO	Bush muhly grass	Muhlenbergia porteri
MURE	Mat muhly	Muhlenbergia repens
MURI	Deergrass	Muhlenbergia ridgens
cfMURIG		cf Muhlenbergia rigida
NOMI	Sacahuiste, beargrass	Nolina microcarpa
OCOTILLO	Ocotillo	Fouquiera splendens
OENO	Evening primrose	Oenothera sp
OPEN PANICLE		Panicum hirticaule
OPSPI	Cholla	Opuntia spinosior
OPULEP	Christmas cactus	Opuntia leptocaulis
OXLI		Oxybaphis linearis
OXY		Oxytropis sp
P38		unknown perennial forb
PABU		Panicum bulbosum
PAIN	Mariola	Parthenium incanum
PAN sp	Panic grass	Panicum hirticaule
PAOB	Vine mesquite grass	Panicum obtusum
PAPERFLR	Paperflower	Psilostrophe sp
PASE		Paspalum setaceum
PEFL		Petalostemum flavescens
PELI		Penstemon linarioides
PEN SP	Penstemon	Penstemon sp
PENST	Penstemon	Penstemon sp
PICE	Pinon pine	Pinus cembroides
PIDI	Pinon pine	Pinus discolor
PIFI	Pinon ricegrass	Piptochaetium fimbriatum
PIFL	Limber pine	Pinus flexilis var reflexa
PINON	Pinon pine	Pinus sp
PIPO	Ponderosa pine	Pinus ponderosa
PIPR		Piptochaetium pringlei
POFR	Cottonwood	Populus fremontii
POL SP		Polygonum sp
POOB		Polygala obscura
PORTULACA	Purslane	Portulaca sp
PPEAR	Prickly pear	Opuntia sp
PRGL	Mesquite	Prosopis glandulosa
PROBOSCIDEA	Devil's claw	Proboscidea sp
PROSOPIS	Mesquite	Prosopis sp
PRVI		Prunus virgata
PSME	Douglas fir	Pseudotsuga menziesii
PSOR		Psoralcea tenuiflora
PSTA		Psilostrophe tagetina
PURPLE LINEAR		

PURPLE TRUMPET VINE		Ipomoea leptotoma
QUAR	Arizona white oak	Quercus arizonica
QUE SP		Quercus sp
QUEM	Emory oak	Quercus emoryi
QUERCUS		Quercus sp
QUGA	Gambel oak	Quercus gambeli
QUHY	Silverleaf oak	Quercus hypoleucoides
QURU	Netleaf oak	Quercus rugosa
QUTO	Toumey oak	Quercus toumeyi
RAINBOW	Rainbow cactus	Echinocereus cf pectinatus
RED GLAND		Eriochloa acuminata
REED		reed
RHMI	Littleleaf sumac	Rhus microphylla
RHCH	Evergreen sumac	Rhus choriophylla
RHRA	Poison oak	Rhus radicans
RHTE		Rhyncosia texana
RHTR	Skunkbush	Rhus trilobata
ROSETTE	Rosie floret	Mollugo verticillata
RUMEX		Rumex sp
SACATON	Sacaton	Sporobolus wrightii
SAGO	Willow	Salix goodingii
cf SALVIA		cf Salvia sp
SASA	Soapberry	Sapindus saporina
SATA	Yewleaf willow	Salix taxifolia
SCBR	Burrograss	Scleropogon brevifolius
SCCI	Texas bluestem	Schizachrium cirratum
SEDGE	Sedge	
SELLOA		Selloa sp
SELO		Senecio longiloba
SEMA	Plains bristlegrass	Setaria macrostachya
SIDA		Sida sp
SIHY	Squirreltail grass	Sitanion hystrix
SILE		Sida lepidota
SINE		Sida neomexicana
SOEL	Horsenettle	Solanum eleagnifolium
SOLANACEAE	Prickly tomato	unk Solanaceae
SPCO	Spike dropseed	Sporobolus contractus
SPFL	Mesa dropseed	Sporobolus flexuosus
SPH SP	Mallow	Sphaeralcea sp
SPORO		Sporobolus sp
SPRUCETOP	Sprucetop grama	Bouteloua chondrosioides
SPSP	Mallow	Sphaeralcea sp
SPSU	Mallow	Sphaeralcea subhastata
SPWR	Sacaton	Sporobolus wrightii
STEPH		Stephanomeria sp
STPA		Stephanomeria pauciflorus
SYOR	Snowberry	Symphoricarpos oreophilus
TAAU		Talinum aurantiacum

TARBUSH	Tarbush	Flourensia cernua
THELO		Thelosperma megapotamicum
THMO		Thermopsis montanum
TRAGIA		Tragia sp
TRAR		Trichostemma arizonica
cf TRAR		Ayenia filiformis
TRIXIS		Trixis californicus
TRCA		Trichachne (=Digitaria) californica
TRMO	Crinkleawn	Trachypogon montufari
TRMU		Tridens muticus
TRPI		Tradescantia pinetorum
TRPU	Fluffgrass	Tridens (=Dasyochloa) pulchella
TUMBLE		Tall comp forb, sm white flrs, short lvs
TURPENTINE	Turpentine bush	Haplopappus laricifolius
UNID		Unidentifiable
UNKC		unknown Composite forb
UNKCSH		Unknown Composite shrub
UNKF		Unknown perennial forb
UNIF		unknown perennial forb
UNKG		Unknown perennial grass
UNKSH		Unknown shrub
UP SPURGE	upright spurge	Euphorbia sp
VEGR		Verbena gracilis
VER SP		Verbena sp
VERBENA		Verbena sp
VIAR	Grape	Vitus arizonica
WHTHORN	Whitethorn	Acacia constricta
WOODY DALEA		Dalea formosa
WOOLY	Wooly bunchgrass	Elyonuron barbiculmis
XMAS	Christmas cactus	Opuntia leptocaulis
YUBA	Spanish dagger	Yucca baccata
YUCCA		Yucca sp
YUEL	Soapweed Yucca	Yucca elata
YUSC	Mountain Yucca	Yucca schottii
ZAUS		Zauschneria sp
ZEPO		Zexmania podocephala
ZIGR	Desert zinnia	Zinnia grandiflora
ZIOB	Crucifixion thorn	Ziziphus obtusifolia